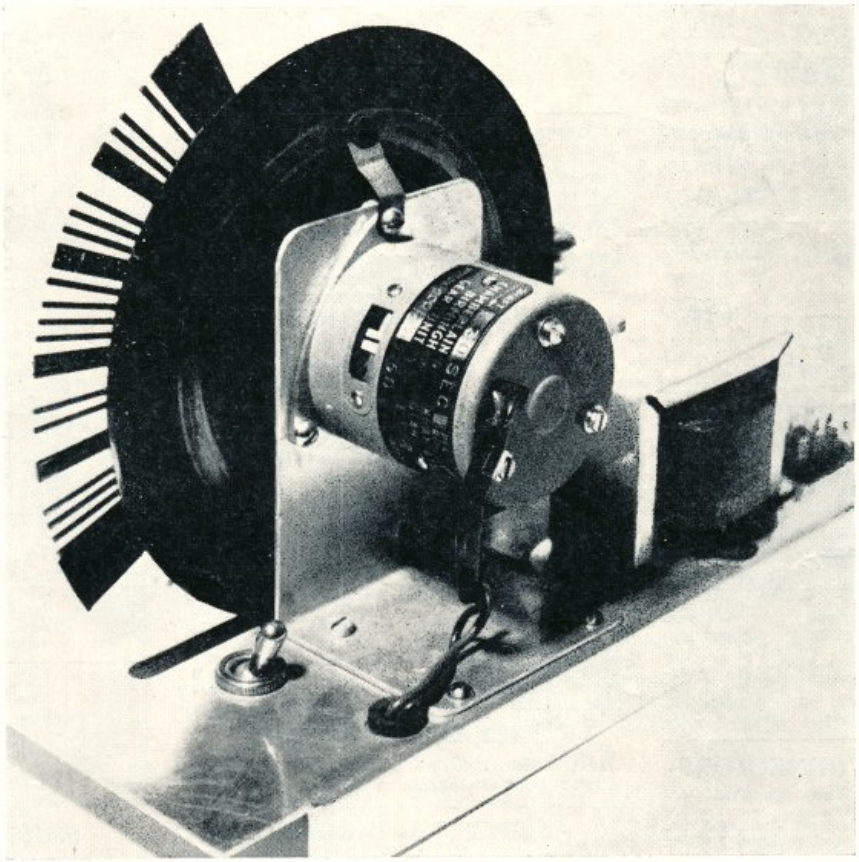
AMATEUR RADIO

MAY 1965



Vol. 33, No. 5

2/6

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MR2P 37/6

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MO65	20Ma.DC 35/-	MO65	1Amp.DC 35/-
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MO65	100Ma.DC 35/-		
MO65	150Ma.DC 35/-	MO65	50 mV DC 37/6
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MR52	500uA.DC 47/6	MR52	50Ma.DC £2
MR52	1Ma.DC £2	MR52	100Ma.DC £2
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OUR COVER

The Thing: This month's cover is a provocative photograph which is more fully explained in the article on page 3. As a matter of interest, can you identify it fully before you read the article?

FEDERAL COMMENT

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During the early part of March, the Wireless Institute Civil Emergency Network (W.I.C.E.N.) was critically tested in bush fires which ravaged eastern Victoria, New South Wales and to a lesser extent, parts of South Australia. Little is known at present on the bushfire emergencies in N.S.W. and South Australia. but a full report was given in last month's journal of the Victorian fires.

It is evident from this report and other information to hand, that the W.I.C.E.N. organisation operated efficiently and contributed largely to the success of the whole Disaster Plan. Despite the extent and severity of the fires, it is a great tribute to all those who took part that no lives were lost and the fires were contained and eventually subdued. The mobility of our present W.I.C.E.N. is a fairly recent innovation, brought about to some extent by the availability of suitable disposals equipment which has been modified and adapted with the usual Amateur ingenuity.

If one hearkens back to the fires of '38/39, the only similarity to the two operations is that Amateurs participated and formed the backbone of the communications network. The equipment used in '38/39 bore little resemblance to the present equipment—it was bulky and cumbersome because it was not designed for the task and lacked simple power supply equipment. The picture of a certain Amateur madly pedalling a Flying Doctor supply is still vividly etched in my mind!

The problem of erecting a suitable antenna when the trees were either burned up or fallen down posed some headaches, but was overcome. The transmitter was most likely the exciter of the home transmitter hastily unmounted and taken to the site which meant that the stations of that time were static and had to rely on local sources of information on the fires by means of runners. How easy it is at the moment to slip away to the fire in a car with the transceiver already set up and operable on the move; but despite the convenience of the bulk of modern equipments, these rigs are by no means the ultimate in such emergencies.

W.I.C.E.N. must not stagnate because at the moment this type of mobile equipment is generally available and readily convertible to Amateur requirements. Not only the organisation but the equipment used must be fluid and versatile. It should be possible to readily operate the equipment in the car, but just as easily dismount and carry it wherever necessary, and still maintain the same degree of communication or better than is demanded at present. There is undoubtedly a need for both h.f. and v.h.f. equipment, especially in thickly forested areas and the ability to maintain 24-hour communication.

These several points, and no doubt others, are the lessons to be learned from the recent emergencies. The W.I.C.E.N. organisation, on a Federal basis, should plan its equipment on semi-circuitry, h.f. and v.h.f. facilities, c.w. or phone and independent of external power sources. Is this too much to ask a body dedicated to experimentation and public service?

Federal Executive, W.I.A.

CONTENTS

V.H.F. REFLECTION FROM METEOR TRAILS

LEN EDWARDS, VK7LE*

IT has been estimated that approximately **100 tons** of matter from outer space falls into the earth's atmosphere every twenty-four hours. The greater bulk of this is in the form of very small particles of the order of a few cms. to a few microns in size which, due to their velocities, are burned up by friction with the upper atmosphere, a small quantity actually reaching the earth's surface before completely burning away. In the burning process, high temperatures are generated which quite often result in the emission of visible light and the familiar meteor trail, while another unseen effect is a trail of ionised particles which may persist for relatively long periods. The visible trail may also persist for a long period under some conditions, one personally observed persisting for 8½ minutes before breaking up and drifting away in upper atmosphere winds.

A large number of ionisation trails reach sufficient density to reflect radio signals, and as most trails occur at an altitude of 80 to 120 kilometres, long distance communication by reflection is possible providing the trail lasts for sufficient time to permit two-way contact.

Although a great deal of research has been done in this field in various parts of the world, very little information has been found for latitudes as far south as Hobart at 43°, and it was therefore considered that here was an interesting field for investigation which could be useful to those interested in this type of propagation. The main points for investigation would be the density, duration and number of trails, and these points could be checked with relatively simple equipment.

H.F. RANGE

Some observations of reflections from ionised clouds, apparently due to the passage of satellites, had previously been made by observing the signal strength in Hobart of Radio Australia and A.B.C. Inland Service short-wave transmitters located in Victoria.

These observations were commenced in 1958 when the U.S.S.R. successfully orbited Sputnik 1 and 2, and have been carried on at intervals up to the present time.

The frequencies monitored were 21.54 Mc. and 15.23 Mc. and as Hobart is normally in the skip zone (also off the back of the beam) the signal normally received is very weak. However, large signal increases of up to 50 db. above one microvolt were noted which could be classified into three characteristic types:

1. Those with durations up to 30 seconds with sudden increase and slow decrease.
2. Those with durations of three to four minutes with slow increase and decrease having a slow fading pattern superimposed.
3. Those with durations of one hour or more, increasing to a steady maximum over a period of several minutes with a slow deep fading pattern.

The Type 1 bursts are undoubtedly due to meteor trail reflection and at 15.23 Mc. do not appear very frequently. They are, however, more frequent on 21.54 Mc., typical count being 50 for the hours 9.30 a.m. to 6 p.m. when the transmitter was on the air.

The Type 2 bursts are unlikely to be due to meteor trail reflection because of their duration and regular pattern. They tend to appear in groups of two or three, separated by intervals corresponding to typical satellite orbit times and recur also over several days at slightly differing times. It is possible to graph the daily arrival times and predict the next day's appearance until the signal finally fails to appear on schedule.

It appears that they are due to satellite induced ionisation, as described by Doctor J. D. Krans (W8JK) in 1958, the exact mechanism being open to argument. It appears also that the occurrence and strength of the bursts depends to a large degree on satellite altitude and the condition of the ionosphere at the time. An attempt was made to correlate bursts with known objects in orbit, but this failed probably because of the large number of bits and pieces of hardware known to be orbiting (over 400 in early 1964). Only weak inconclusive results were obtained from the Echo 2 satellite at an approximate altitude of 600 miles.

The Type 3 bursts are almost certainly due to sporadic fast moving high ionisation density clouds, as good correlation was found between these bursts and the appearance of sporadic E on the records of the Ionospheric Prediction Service in Hobart.

Although these observations are interesting, they are of little value for meteor trail observation because of the limited observing hours and the frequencies involved normally supporting long-distance communication.

LOWER V.H.F. RANGE

It was therefore decided to move to the lower v.h.f. range and the equipment was modified to receive on the frequency of a radio-telephone transmitter in Southern Victoria beamed to Tasmania and on the air continuously. The radiated power is 200 watts on a frequency in the 40 Mc. band. Hobart is only slightly off the aerial beam and from results obtained there appears to be a substantial signal radiated at a high angle. The direct path length is approximately 400 miles.

Receiving equipment for this frequency consists of a converter feeding a modified TR1143 i.f. strip on 9.5 Mc. with noise limiter and 2 kc. tuned audio amplifier.

A beat frequency oscillator is used to produce a 2 kc. beat with the received carrier, which is then passed to a pen recorder and a mechanical counting circuit. All oscillators are crystal controlled and the aerial is a horizontal dipole. A.c. line voltage is regulated.

Two sets of observations have so far been made, the first giving the strength and duration of meteor trail reflections and the second giving the total number and number per minute. In observing strengths and durations, it was found necessary to modify the equipment to respond to only those lasting five seconds or longer, as the large number of reflections received tended to obscure the picture. Indeed there seems to be little doubt that meteors contribute substantially to the background ionisation level of the ionosphere.

Typical received signals reach a strength equivalent to 20 microvolts average at the aerial terminal while some reach as high as 100 microvolts. The number of reflections having a duration of five seconds or longer is approximately 700 during a typical 24-hour period and approximately 30% of those should provide a workable circuit for 10 seconds or more. Reflection durations of 30 seconds or longer are rare, but occasionally appear.

For checking the actual number of reflections the 2 kc. beat note from the receiver is fed to a Schmitt trigger which operates a relay and mechanical counter each time the amplitude reaches a certain threshold value. Circuitry is arranged so that only one count is registered independent of signal duration and strength, and a fixed d.c. output pulse is given for each operation of the counter. The d.c. pulses are stored in a resistance capacity circuit which is mechanically discharged by a cam every minute, the charge on the condenser being recorded on the pen recorder at one minute intervals. The indications given are therefore total count and count per minute, and results indicate typical totals of over 5,000 per 24 hours with peak counting rates of 20 per minute at maximum and one every two to three minutes at minimum.

The theoretical diurnal change in numbers due to earth rotation and the orbital motion of the earth is quite marked, with the maximum number occurring between 0500 and 0700 hours, and a minimum at 1800 hours.

The maximum is quite broad but falls off rapidly after 1200 hours and builds up gradually after 2400 hours. There is also a very marked tendency for reflections to arrive in groups and this is most noticeable during the minimum period.

An interesting point is the shift in frequency observed on some reflections, apparently due to Doppler Shift because of the rapid motion of the reflecting point. In some cases the shift is quite spectacular, starting at a high note and rapidly moving to a fixed lower note with an overall shift of approximately 2 kc.

This indicates motion of the reflection point towards the observer, and although it is unlikely that the point

(Continued on Page 6)

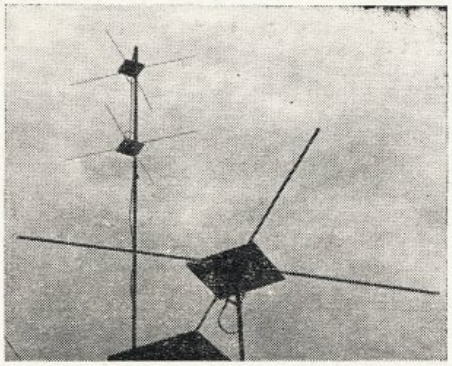
* 10 Musgrove Road, Lindisfarne, Tas.

THE VK5 SIX & TWO METRE BEACON STORY

BRIAN G. TIDEMAN, VK5TN*

EARLY in 1963 the W.I.A., S.A. Division V.h.f. Section, appointed a committee of five to investigate the possibility of and the construction, if possible, of a six-metre beacon transmitting station.

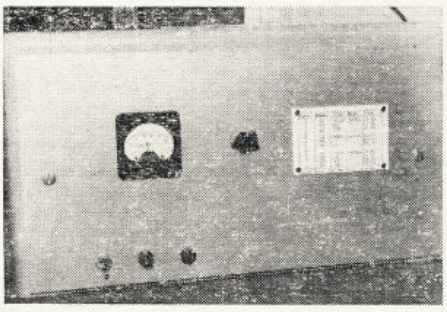
We in VK5 had become aware of the advantages and the desirability of the W.A. V.h.f. Group Incorporated beacon VK6VF and so the VK5 beacon was soon under construction. The aim of the beacon transmitter was to provide data on propagation and band openings, and as a by-product, to provide a local signal of accurately known frequency and strength for local receiver adjustment.



Two-Metre (left) and Six-Metre Turnstile Antennae.

The major hurdle at the beginning was that of obtaining 24-hour operation. The P.M.G. Department would not agree to unattended operation under any circumstances, and insisted that all operations be in compliance with the "Regulations".

Fortunately we were able to use the ADS7 transmitting site where a resident engineer, who also holds the Amateur Licence, is in permanent attendance. To further cover the beacon operation, other members of ADS7 staff, who had Amateur Licences, were also co-opted. For the beacon transmitter to be fully effective, it was necessary to have it running for the maximum possible time, i.e. approaching continuous operation, and after negotiations to this end, proceedings continued.

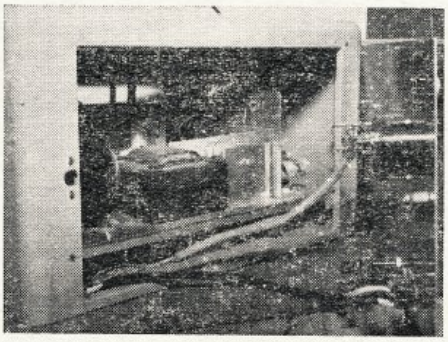


Beacons in operations—front panel view.

* Chairman V.h.f. Section, W.I.A., S.A. Div., 33 Ningana Ave., King's Park, South Aust.

Eventually the transmitter and turnstile antenna were completed (with provision for a two-metre beacon to be installed at a later date) and put on the air in June 1963 and one month later, the two-metre beacon was installed together with its stacked turnstile antenna.

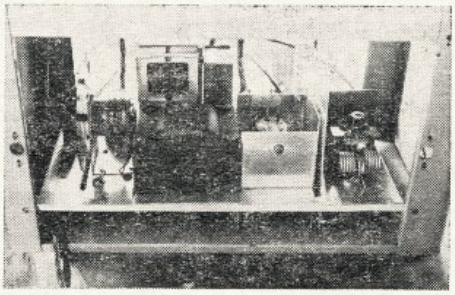
The call sign used was that of Mr. R. L. Paech, VK5LP, and the frequencies used were 50.500 Mc. and 144.500 Mc. (50.5 Mc. happens to be the frequency of JA1IGY and in fact the beacon caused some consternation at a government research station that monitors JA1IGY). In July 1963 the call sign was changed to the Section call sign, VK5VF (which falls into line with VK6VF).



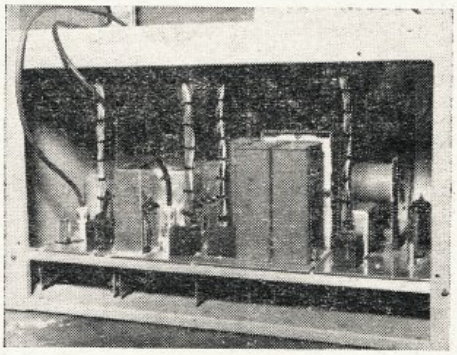
Front view—panel ajar.

It was then that some problems arose. Firstly, the two-metre frequency happened to be uncomfortably close to that of VK3WI, and secondly, the fundamental type oscillators and exciters of the two transmitters were mixing and producing stray spots approximately ±1 Mc. from the two-metre frequency, and weaker spots at alarmingly frequent intervals across the two-metre band.

However, after many tense discussions and eventually some tests at the transmitters and at the receivers, the troubles in the two-metre band were



Front view of Keyer, Power Supply, Two-Metre and Six-Metre Chassis.



Rear view of Six-Metre and Two-Metre Chassis, Power Supply and Keyer.

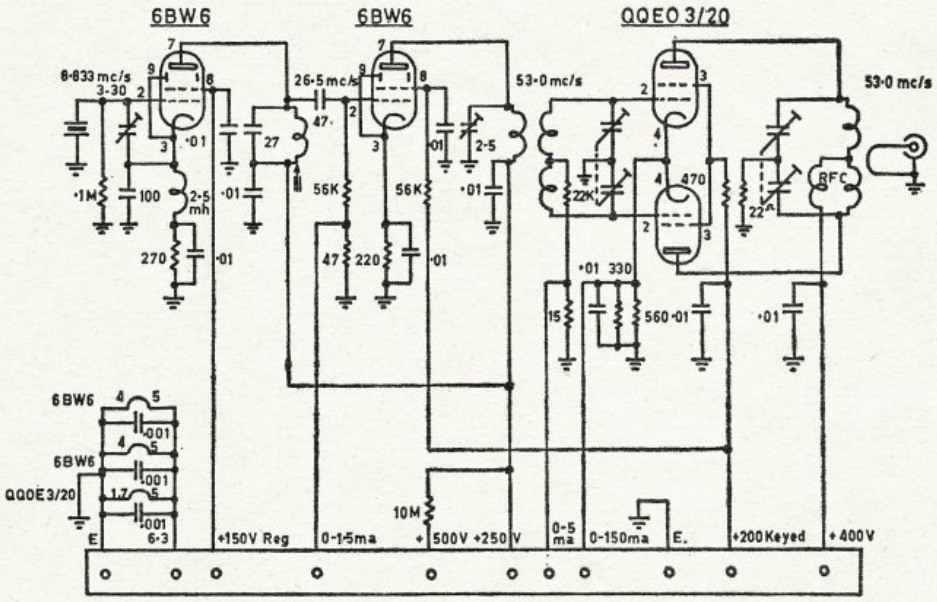


Fig. 1.—Circuit of the Six-Metre Transmitter. (The Two-Metre Transmitter has one extra 6BW6 multiplier stage and a QQE06/40 final instead of the QQE03/20.)

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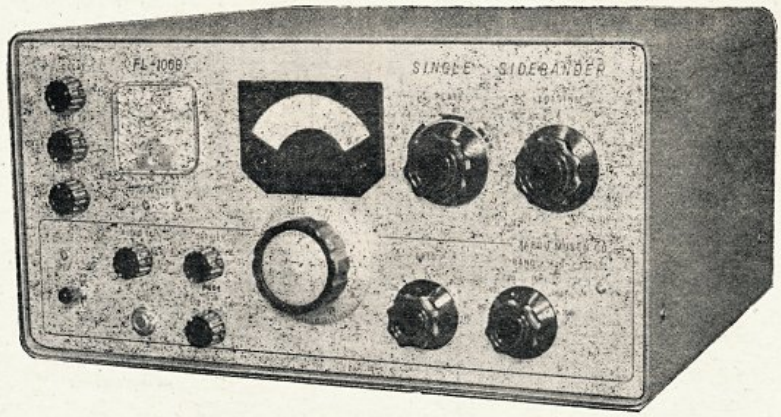

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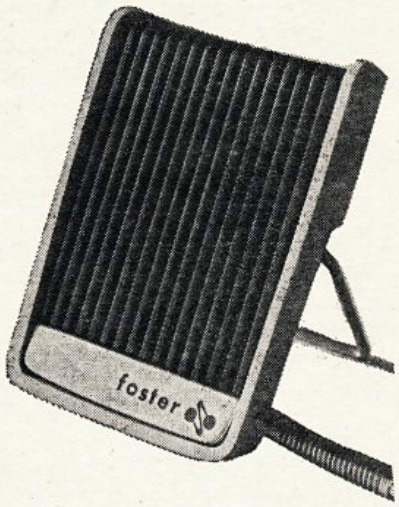

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cured by improving the shielding and by-passing between the six and two-metre exciters. In August 1963, the two-metre frequency was changed to 144.800 Mc.

On April Fool's Day, 1st April, 1964, when VK Amateurs lost the 50-52 Mc. segment of the six-metre band, the six-metre beacon frequency was changed to 53.000 Mc. and both transmitters were adjusted accurately to frequency. Subsequent checks showed a daily frequencies shift of about +400 to —400 c.p.s. on both transmitters, the shift being due to the wide temperature excursions encountered at Pine Lodge, Mount Lofty.

DESIGN

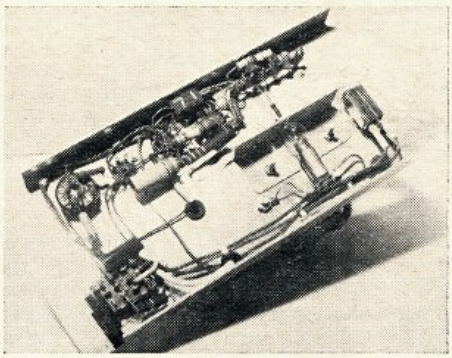
As can be seen by inspection of the circuit diagrams, the beacons have been made as reliable as possible (they have been running almost continuously now since June 1963 with only the initial teething troubles of a shorted power diode, an open-circuit RFC and moisture upsetting the operation of the then unsealed crystals) through the use of premium quality valves throughout, an optical keyer (the main initial worry until this was decided), protective cathode bias, and frequent voltage and current monitoring.

An important design feature was that of the antenna to be used. The final choice was a turnstile on six metres and a pair of turnstiles on two metres, both antennae being fed with UR70 co-axial cable.

The power input on both bands is approximately 30 watts, with the last two stages being screen keyed (there is some chirp noticeable on two metres only). The power supply uses an old 220 volts a side, 300 mA., power transformer to supply 250, 150 regulated and 400 volts.

The keying cycle consists of approximately 23 seconds of carrier, 6 seconds of the call sign VK5VF sent in type A1 emission, and 1 second of no carrier. Thus the call sign is transmitted once every 30 seconds, the carrier is on for a maximum length of time, and a period of no signal is left for receiver checking purposes.

The optical keyer employs a six-inch metal disc with the modulation consisting of pieces of wire soldered on to the circumference, the disc rotating between the light source (an automotive 12 volt 6 watt lamp running at half voltage—the original lamp is still in use) and an OAP12 light sensitive diode.



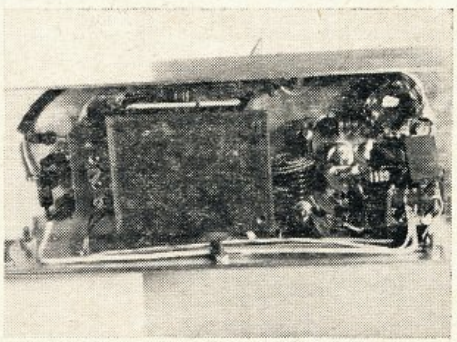
Keyer Chassis—underside view showing Keyer Optics.

OPERATIONAL DATA

Due to a number of unfortunate circumstances, the existence of the beacon has not been publicised overseas and consequently no doubt, no reports of overseas reception (apart from New Zealand) have been received to March 1965.

In February and March 1964, Lance VK3AHL and David VK3AAU did some excellent work on meteor reflection of the 50.500 Mc. beacon, and one burst of the 23 seconds of continuous carrier and a few bursts of the full call sign were received. (The V.h.f. Section has a tape of these signals as received in Melbourne, if anyone is interested in hearing it.)

Six-Metre Transmitter—top view (xtal plugged into xtal oven holder—oven not in use due to unsuitability of xtal).



Six-Metre Transmitter—underside view.

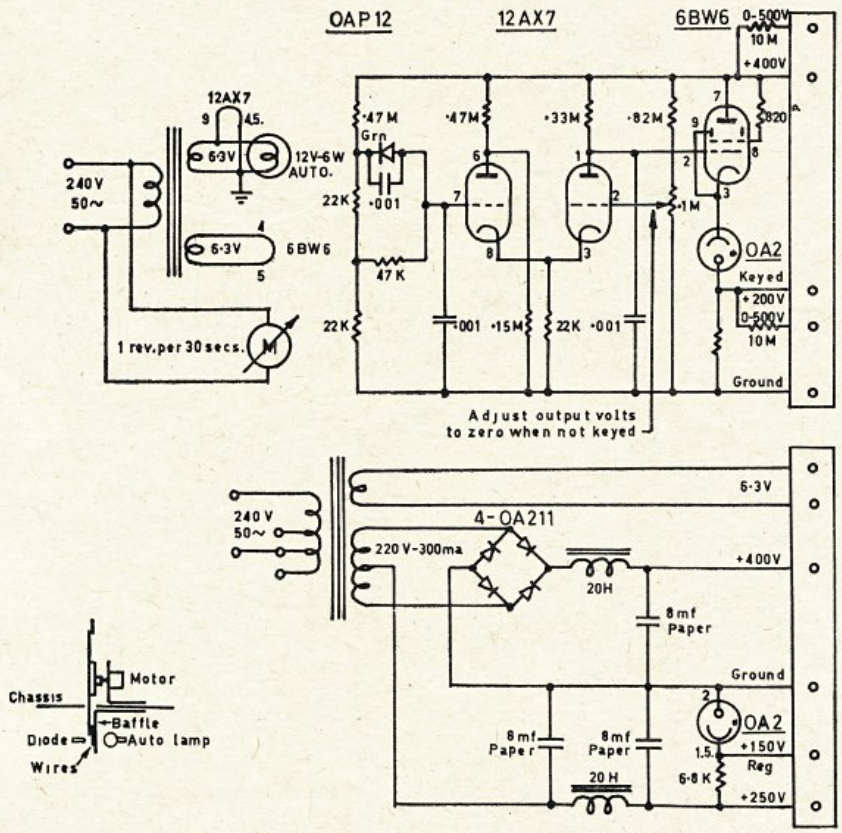


Fig. 2.—Above: Circuit of the Keyer. Below: Power Supply.

Noted: Light on, Keyer on, 12v. auto parking lamp is used here on 6.3 volts. Light is passed through hacksaw slot in aluminium baffle. Narrow slot gives sharp keying. The monitor meter is 0-50 μA. used with multi-position switch.

Also in March 1964, we received the first report of reception of the two-metre beacon in Hobart, Tasmania.

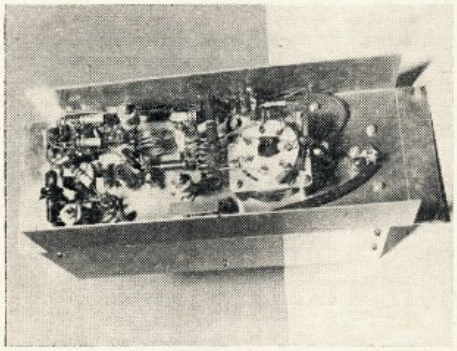
Perhaps one of the best uses to which the beacons have been put during this last season is that done by Colin Hurst (VK5ZHJ) in Gawler, S.A., and Andrew Martin (VK6ZCN), portable at Bunbury, W.A. (a distance of 1330.6 statute miles) when they worked two-way on two metres and two-way duplex six and two metres after a month or so of Andrew monitoring 144.800 Mc. and Colin monitoring Andrew's six metre frequency.

Investigation into the phenomena present at the time of this particular contact, and by reference to the other contacts between Eastern Australia and New Zealand on two metres in the same month, has brought to light the fact that it is extremely likely that these

1,000-mile or so paths now so commonly being worked on two metres are not only a result of very intense sporadic E layer ionisation being present, but also the fact that the weather conditions may have been conducive to tropospheric bending at several points on the paths, enabling a more oblique angle of incidence of the radio wave to be obtained on the Es sheets and therefore obtaining the extraordinarily high frequency of E layer reflection of 144 Mc.

It is understood also, that a VK2 Sydney v.h.f. enthusiast has a receiver fixed tuned to 53.000 Mc. and so connected to his two-metre transmitter that on receipt of the six-metre beacon signal from Adelaide, it will transmit a warning signal to the Sydney Amateurs on their most popular v.h.f. band. A Darwin station also has a fixed tuned receiver operating.

Two-Metre Transmitter—top view (using QQE06/40 p.a.).



Two-Metre Transmitter—underside view.

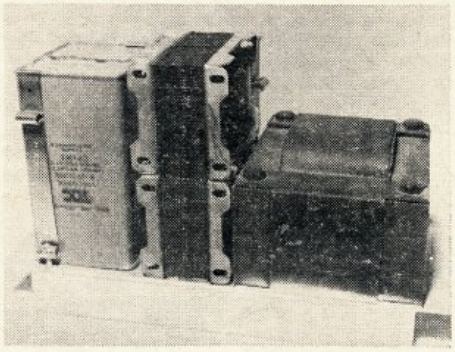
A 432 Mc. beacon transmitter may have to be re-considered, now that 432 Mc. signals have been exchanged between the Adelaide suburban area and Ballarat, Victoria.

CONCLUSION

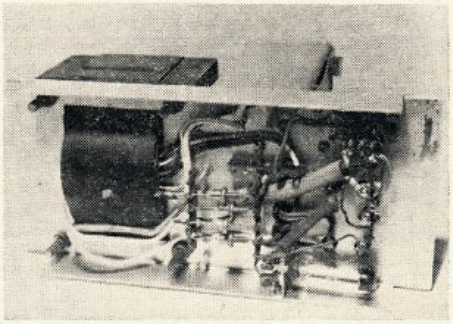
The South Australian beacon VK5VF has so far more than fulfilled the aims behind its conception.

It is to be hoped that in the event of publicity elsewhere, the beacons will be used to an even greater extent, to increase Amateur and other knowledge in the wide open field of electromagnetic propagation at v.h.f. and u.h.f.

The Australian Amateur has, in the last two years, heard a **reliable** beacon on both six and two metres and it is hoped that the other States of Australia will co-operate in this venture as they have already promised to do.



Power Supply—top view (note military components!!).



Power Supply—underside view.

ACKNOWLEDGMENTS

This article would not be complete without thanking the various people who contributed to the project. Please accept my humble apologies if I have made any omissions. Those who must be thanked are:—

The Directors of Television Broadcasters Limited for their co-operation in making available the excellent site and facilities at a purely nominal annual cost.

The technical staff of ADS7 at Pine Lodge, Mount Lofty, for their assistance and also to Mr. Bob Broad (VK5ZYX) and his good wife, for putting up with "the grey box of spurious signals" (in addition to the t.v. QRM). (On the few occasions that the beacons are off the air, Bob VK5ZYX is operating.)

Mr. C. G. L. Tilbrook for the generous supply of crystals.

The Superintendent, Radio Branch, P.M.G's Department.

Mr. K. Horan and The Telecommunications Company of Australia for the supply of the two-metre final amplifier valve.

Mr. G. Herden for supplying the power transformer and other components.

Mr. A. McDonald, of Port Pirie, for expertly producing the photographs and the photographic album.

Mr. R. L. Paech for the initial use of his call sign.

Members of the committee responsible for the planning, construction and maintenance of the beacons, viz. Messrs. R. Fairweather (VK5ZFG), A. West (ex-VK5LA), B. Tideman (VK5TN), R. Matthews (VK5ZFQ), and R. Murphy (VK5ZDX).

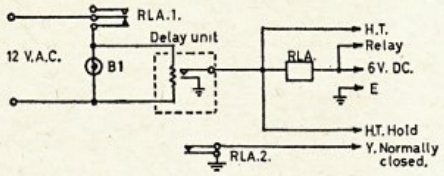
Finally, I would like to particularly thank the chairman of the beacon committee, Mr. A. L. West (ex-VK5LA), for the invaluable part that he played from the technical design standpoint, for his liaison with the Postmaster General's Department, and for the supply of components. ●

H.T. DELAY CIRCUIT

Although mercury vapour rectifiers are fast being replaced by silicon diodes, some type of h.t. delay circuit is essential in a modern Amateur Radio station, even if only to reduce the numbers of control switches.

There are numerous delay methods and circuits available, three of which come to mind are: thermal types (e.g. type S), RC delay circuits with transistor or valve relay control, and circuits utilising the heater warm-up time of a vacuum tube.

Which ever delay method is employed, the circuit should be arranged so that the delay components are switched out, and allowed to revert back to the ready condition after they have operated.



A suitable circuit, incorporating a type S delay unit, is shown in the accompanying diagram.

At the same time as the equipment heaters are brought on, twelve volts a.c. is applied via the normal closed contacts RLA1 to the delay heater. After a pre-set time the micro-switch is actuated, closing relay A which holds closed through RLA2 contacts and the external control switch (may be l.f.-v.h.f. transmitter selector, if a common p.s. is used).

The delay is brought back into action by opening X-Y, or loss of a.c. or 6 v.d.c. supplies.

—R. N. Ferguson, VK3ZGZ.

☆

V.H.F. REFLECTION FROM METEOR TRAILS

(Continued from Page 2)

would move away from the observer, resulting in a change from a low to a high note, this has actually been observed on several occasions. It is also interesting to note that reflections from "satellite induced ionisation" is evident at this frequency although appearances are less frequent and of shorter duration than on 15 and 21 Mc. By graphing these appearances from day to day it is again possible to predict the next day's appearance time with some certainty. Whereas on 15 and 21 Mc. appearance occurred in groups with intervals corresponding to successive satellite passages, on 40 Mc. only single appearances are evident.

Here perhaps are predictable openings which could be used for 50 Mc. long-distance communication and the chance for a "first"—by means of propagation via satellite induced ionisation. ●

THE BRUCE ARRAY ON 7 Mc.

AL. SHAWSMITH, VK4SS*

IT would be safe to say that the easily erected 7 Mc. g.p. or quarter wave vertical, is the most popular DX antenna, particularly for the city dwellers with their small yard space. For transmitting, its low angle of radiation makes it very efficient. (It would be necessary to have a horizontal antenna some 60 to 70 ft. high for the same fine angle of radiation.) However, the 7 Mc. g.p. is a poor receptor for DX, by virtue of the fact that it simply does not present enough "captive area" to any weak signal.

Those who live in city allotments cannot erect a rhombic, of course, but if there is reasonable room, a very efficient Bruce Array can be put up. Let me say before going any further, that this type of curtain is a one-band bi-directional affair; but just as effective for transmitting as receiving.

Fig. 1 shows a five-element vertically polarised with maximum radiation broadside to its length. Over 300 feet of wire is compressed, so as to make all the vertical elements carry current in the one direction. The top and bottom sections have current flowing in opposite directions, thus reducing radiation to a minimum. The overall length is not critical, so long as it is a foot or two of five wavelengths. The array can be lengthened to incorporate any number of vertical elements, but due to the concertina effect of the structure, wave-shift begins to appear after half a dozen vertical elements. This is easily correctable. It requires no appreciable height; the bottom wire can be a few inches above ground, or the array can be pulled off vertical (as mine is), so it is possible to walk or drive a car underneath.

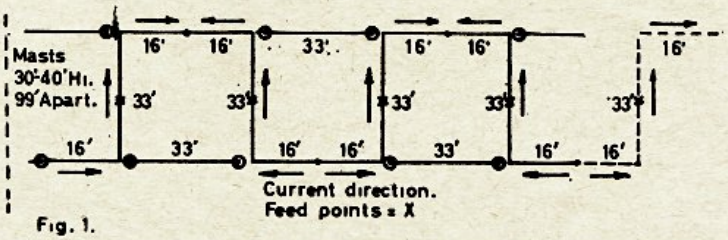


Fig. 1.

The 16 ft. wire length at each end can be strung away from antenna. For 80 metres all measurements are doubled.

If one is to have a chance of reading the really weak ones, it is necessary to receive off a directional array or a long wire. Those who have been fortunate enough to make an instant switch from a short vertical receptor to a long wire or rhombic, will know what I mean. Where no signals at all exist on the former, the band is crowded on the latter.

It is only important to remember that it must be fed at any of the points marked X (current fed) with tuned lines. Feed at the centre element is perhaps most desirable. It accepts current like most long wires. Over the entire 7 Mc. band, it has no frequency discrimination. Radiation resistance is not known, but possibly around 100 ohms—with tuned feeders a mismatch of three or four is not at all critical. Parallel or series tuning will depend on feeder length. Less than four vertical elements is not recommended if worthwhile gain both in transmitting and receiving is desired. Four elements can be erected in about 90 ft. yard space and five elements in 130 feet approx.

In the writer's case the bottom of the system has been pulled away so it is possible to drive underneath. It is orientated so that it covers Europe and Asia in the one direction, and South America and North Africa and Europe on the long route. My 7 Mc. ground plane stands on the roof; the five element Bruce Array runs between two houses, trees and other obstacles. On receive, to switch from the g.p. to the Bruce Array is a revelation—a dead band simply springs to life. It is better than one S point over the g.p. in its maximum radiation and off the ends a couple of points worse.

Anyone fortunate enough to have poles or supports in the vicinity of 50 to 60 feet and have a semi-rural environment would find such an array on 80 mx very efficient indeed.

Gain in db. depends on the number of elements used. ●

* 35 Whynot St., West End, Brisbane, Qld.

Stabilising Oscilloscope Patterns Against Mains Variations

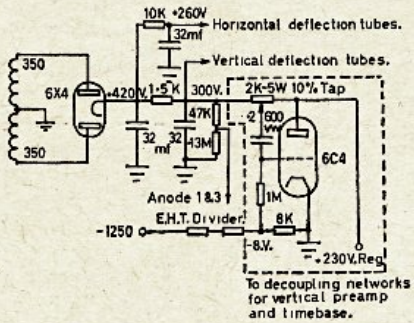
This annoying problem had been a challenge to the author for many years. It is overcome in the more expensive types of equipment with correspondingly complex circuitry too subtle and often too bulky to incorporate into regular service equipment.

The problem has now been simply solved once and for all with a 6C4 power triode in a negative feedback voltage regulating circuit. The triode works in effect as a gas regulator tube would. However, it is much more stable and corrects impulses instantly whereas the time constant of a gas regulator tube is just not good enough for oscilloscope work. The regulated voltage is not always convenient either.

The regulated voltage of the circuit described may be selected to suit the design value of the instrument concerned by adjusting the operating bias and the value of plate resistor.

The grid capacitor tap is 10% along the plate resistor from the plate end.

Bias for the triode is obtained from the e.h.t. divider by inserting the necessary resistor in the ground end. This has negligible effect on the intensity and focusing controls forming part of the divider. Bias values for 10 mA. 6C4 plate current at various plate voltages are given in Table 1. For other values of plate current, the tube curves should be consulted.



The author's presently modified oscilloscope is a ten-year-old, having a 6 Mc. vertical amplifier directly coupled to the deflection plates. The two vertical preamplifier stages were regulated and also the hard valve time base.

It was found that the 4 x 32 μF. high tension capacitive filter network was now partly redundant. Two of the capacitors and their accompanying resistors were removed. This allowed space for mounting the regulating components. It also provided a boosted high tension voltage allowing regulated output voltage to be maintained at manufacturer's design value.

Regulated Voltage	Bias Voltage
100 volts	—1.5 volts
125 ,,	—2.5 ,,
150 ,,	—4.0 ,,
175 ,,	—5.0 ,,
200 ,,	—6.0 ,,
225 ,,	—7.5 ,,
250 ,,	—9.0 ,,
275 ,,	—10.5 ,,

Table 1.

Although the circuit is not original, its simplicity and extraordinary effectiveness may be of benefit to many Amateurs.

—Clem Maloof, VK2AMA.

DEPARTMENT OF EXTERNAL AFFAIRS

ANTARCTIC DIVISION

RADIO TECHNICIANS & OPERATORS WANTED

CONDITIONS OF EMPLOYMENT

Two to four months' preparatory work in Melbourne followed by approximately twelve months at the Station. Tentative sailing dates:—Macquarie Island — early December, Mawson and Wilkes — late December. Whilst absent from Australia, kitting and maintenance are provided free by the Commonwealth, and there is an allowance of 37½% of salary up to a maximum of £700 per annum, in addition to which a district allowance of £325 per annum for married men and £200 per annum for single men is paid. Recreation leave accrues at rate of five weeks per annum. Subject to the provisions of the Income Tax Assessment Act, Zone Allowance deduction of £270 may be allowable. Salaries commence within the appropriate range according to qualifications and experience. Employment will be in a temporary capacity under the Public Service Act 1922-1964.

SUPERVISING TECHNICIAN: Mawson (1) and Wilkes (1)

Salary, including allowances*: Married man £2763 per annum; Single man, £2638.

Duties: Install and maintain HF transmitters up to 5 KW output, HF communication receivers, portable field equipment, ground aeradio communications and navigation equipment, radio teletype systems and fixed antenna systems and telephone lines and instruments.

Qualifications: Qualified Senior Radio Technician. Wide experience in the maintenance or installation and testing of radio communications transmitters and receivers and radio navigation equipment.

TECHNICIAN (RADIO): Mawson (1) and Wilkes (1)

Salary, including allowances*: Married man £1858-£2070 per annum; Single man £1733-£1945.

Duties: Install and maintain radio and communications equipment under supervision.

Qualifications: Radio Tradesman with experience in the maintenance and installation of HF radio communications transmitters, receivers and associated equipment.

RADIO SUPERVISOR: Macquarie Island (1)

Salary, including allowances*: Married man £2185-£2301 per annum; Single man £2060-£2176.

Duties: Install and maintain radio transmitting and receiving equipment, and act as Senior Radio Telegraphist.

Qualifications: Applicants should state any appropriate licence or technical diploma held by them. A thorough knowledge of theoretical and practical electronics plus a First Class Commercial Operator's Certificate of Proficiency or equivalent service experience.

RADIO OFFICER: Macquarie Island (2), Mawson (4) and Wilkes (4)

Salary, including allowances*: Married man £1935-£2166 per annum; Single man £1810-£2041.

Duties: Radio Telegraphist.

Qualifications: Commercial Operator's Certificate of Proficiency or equivalent service experience, together with experience in operation and maintenance of ground installations.

SENIOR OBSERVER (RADIO): Macquarie Island (1) and Wilkes (1)

Salary, including allowances*: Married man £2301-£2416 per annum; Single man £2176-£2291.

Duties: Maintenance and operation of radiosonde and radio/radar wind equipment and evaluation of instrumental records for reports.

Qualifications: Applicants must have educational qualifications to Intermediate Certificate standard and be trained as Radio Technicians. They should be experienced in:—

(i) UHF, VHF and microwave equipment.
(ii) pulse techniques.
(iii) frequency modulation.

Training: Successful applicants will be trained at a course in Melbourne commencing on 26th July, 1965.

WEATHER OBSERVER (RADIO): Mawson (1)

Salary, including allowances*: Married man £2012-£2243 per annum; Single man £1887-£2118.

Duties: Taking of meteorological observations and the operation and maintenance of meteorological electronic equipment.

Qualifications: Applicants must have educational qualifications to Intermediate Certificate standard and be trained as Radio Technicians. They should be experienced in:—

(i) UHF, VHF and microwave equipment.
(ii) pulse techniques.
(iii) frequency modulation.

Training: Successful applicants will be trained at a course in Melbourne commencing on 26th July, 1965.

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*Please note that all salaries quoted include allowances. These allowances are payable only whilst serving in Antarctica. Salary whilst on duty in Australia may be calculated by deducting allowances, e.g., a married man receiving £1897 whilst absent from Australia would receive salary of £1143 whilst in Australia, i.e., £1897 less £429 (37½% of salary) less £325 (district allowance). A single man would receive £125 less than the married man because of variation in district allowance payable.

Applicants for positions of Weather Observer and Weather Observer (Radio) should be at least 21 years of age.

Applicants must be in robust health. Ice or snow experience not required but history of outdoor activities is desirable.

Applications, which must be accompanied by a recent photograph and the names of at least three referees, should be lodged with the undermentioned addressee.

The Director,
Antarctic Division,
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568 St. Kilda Road,
Melbourne, S.C.3, Victoria.

Please send me an application form for position of ..... with 1966 Australian National Antarctic Research Expeditions.

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(PLEASE COMPLETE IN BLOCK LETTERS.)

The Historical Development of Radio Communication

PART SIX—THE ADVENT OF THE EFFECTIVE ANTENNA

J. R. COX,* VK6NJ

CHAPTER FIVE

THE CONQUERING OF DIRECTIVITY

Directional transmission of electro-magnetic waves was known long before the phenomenon had any practical application to telegraphic wireless communication. Heinrich Hertz, in his original researches, had demonstrated that electro-magnetic wave radiation could be confined to form a beam. He achieved this with the use of parabolic mirrors which were about "two metres high and one metre in width."[96] Over a very **short** range he obtained successful results using a wavelength of about two-thirds of a metre.

With the advent of practical wireless telegraphy, its early pioneers realised that channelling radiation in certain directions held advantages. The problem was to adapt or evolve apparatus possessing directive properties for transmission over **long** ranges.

It was realised that only the radiation in the direction of the line between transmitter and receiver was of use. All other radiated power represented a loss. By confining radiation to a narrow beam the signal intensity would be increased in the desired line of transmission. A narrow band of transmission meant greater secrecy and the availability for other wireless stations of more spectrum space. Directivity was also acceptable economically as the effect of beaming was the same as increasing the apparent power output of the transmitting station without attendant increase in cost. A gain of directivity in transmission also meant a gain of directivity in reception with beneficial discrimination against interference because of the reduction of signal strength from the directions not favoured.

When Marconi first attacked the problem of practical wireless telegraphy he utilised the Hertzian mirror technique as a means of propagation. Using copper parabolic mirrors he projected a beam of radiation towards a certain point and was able to detect it at the maximum range of about two miles.

Marconi's initial experiments had indicated that the spark-gap transmitter was unsuitable for the production of short waves, but was suited to the generation of electro-magnetic waves of **long** length. This brought about the eclipse for a time of experiments on short wave propagation. The employment of long wavelengths in turn made the use of parabolic reflectors impracticable because they had to be large when compared with the length of the electro-magnetic wave itself.

Following the discovery that transmission range was immensely increased by the coupling of an elevated long wire antenna, Marconi centred his attention on that as the medium for propagation. His main aim from the outset had been the development of practical transmission and that target at first overrode the specialised task of directivity.

In 1896 the Marconi practical wireless telegraphy experiments had demonstrated the use of a long wire antenna upheld by a kite. His later tests included tin-foiled kites and insulated strips of wire mesh, one hundred and twenty feet long, suspended from vertical masts. These high aerials were omni-directional. It was experimental findings using this type of antenna which led to the enunciation of the Marconi rule postulating that transmission range increased proportionately with the square of the height of the antenna.[97] This arbitrary rule had a direct influence upon the development of early wireless antennae, as it clearly indicated the need to increase height for distance communication. This factor was apparent in antenna design for the first trans-Atlantic signalling venture. By then the wavelengths employed were in the vicinity of two miles long.

An attempt to achieve directive radiation was made by S. G. Brown in 1899. Brown explained that non-symmetrical radiation resulted from combination aerials. He specified that some directivity could be gained by connecting a pair of vertical antennae to one of the spark balls of a spark-gap oscillator. By spacing the antennae one half wavelength apart it was claimed that both reception and transmission were best in one given direction. Three years later Lee de Forest, of triode valve fame, patented an invention of a similar nature. These appear to be the first propositions for the combination of multi aerials, nowadays called aerial arrays. It is noteworthy to add that modifications of both these original schemes are utilised at the present time.

Attention was also given to directive antennae at receiving stations. Here the problem was to determine the direction of the transmitter. When this was done the receiving aerial could then be set to absorb the maximum energy radiated by the distant station. One interested in this work was F. Braun, who, in 1903, employed an upward sloping antenna inclined towards the incoming wave.[98] In the same year de Forest claimed that he could "locate within 10° the direction of a transmitting station".[99] The arrangement with which de Forest found direction is notable for its measure of portability. Shaped in the form of a letter "L" and made of metal plate, the whole arrangement could be swivelled around and orientated broadside on to the incoming waves. In this position the device collected most energy.

Thus for the first decade the propagation characteristics of antennae were a matter of speculation. As explained, directivity was claimed but no definite proof of it had been formulated. In 1906, however, a means of illustrating, graphically, the radiation pattern of various aerials was demonstrated by Guglielmo Marconi. Using a thermal ammeter to measure the value of current, it was shown to be possible by this means to plot the intensity of radiation at points equidistant around each antenna type under test. A decade after his original work Marconi returned to the problem. This was the first systematic survey made and forms the basis of today's methods for taking field strength tests. This initial work was paramount to the further development of wireless communication in general, because from then on the characteristics of each type of aerial could be discovered and hence the best antenna for a particular task could be selected. Apart from this, the fact that antennae differed in directivity, and indeed were capable of it, was established.

By using this systematic approach Marconi showed that "a horizontal aerial in which the length of the flat top largely exceeds the height will radiate more strongly in the direction opposite to the free end."[100] He also found that, as an obvious consequence of the Law of Exchanges which holds good for electro-magnetic radiation, as well as heat and light,[101] "any form of antenna which radiates better in one direction than another must best absorb radiation arriving from the direction towards which it radiates best."[102]

Taking advantage of his findings, Marconi then used a pair of bent antennae to fashion a practical, useful, directive, antenna system. For well over a decade after being patented in 1905,[103] the Marconi trans-Atlantic telegraphy stations employed these directional aerials. Soon after their initial success, their utility was improved by making the horizontal part capable of being swivelled around the vertical section. Independent investigations by Professor J. A. Fleming confirmed, in 1906, Marconi's earlier claims and for well over a decade after this the "bent antenna", as it came to be called, was used extensively in trans-oceanic wireless telegraphy.

Directed wireless telegraphy received further attention by F. Braun when, in 1906, he devised an entirely different method. He arranged three vertical masts to form the points of an equilateral triangle, thirty metres a side. Then, assisted by the methods suggested by two scientists, N. Papaleni and L. Mandellstam, he **directly** excited each antenna with oscillations differing in phase from one another. In this manner it was possible to cause the electro-magnetic waves emitted by the three aerials to combine and promote one another in a certain direction, but neutralise one another in other directions. The nett result of this arrange-

* Government School, Yornup, W.A.

[96] Institute of Radio Engineers (Aust.): op. cit.: p.4 of a paper entitled "Radio Navigation" by D. G. Lindsay.

[97] Fleming: op. cit., p.420.

[98] Ibid., p.652.

[99] Ibid., p.652.

[100] Bucher, Elmer: "Practical Wireless Telegraphy": Wireless Press, New York, 1918, revised edition, p.121.

[101] Lemon and Ference: op. cit., p.220.

[102] Fleming: op. cit., p.656.

[103] Ibid.

ment was a noticeable directivity in a certain direction. Braun's system laboured under the disadvantage of requiring three masts and extra equipment and, when compared with Marconi's bent antenna, was less simple yet only equally as effective. The main trouble with the Braun system was, not its complexity, but, the fact that it had to control **long** wave communication. It was, however, an ingenious development and well ahead of its time, since the principle of out-of-phase excitation is used with real success nowadays.

Another form of aerial which gave an insight into the possible construction of compound antennae, capable of maximum radiation in one direction, was that introduced in 1907 by E. Bellini and A. Tosi. Using a vertical mast they arranged two long wires in the form of an inverted V, which, when fed at the two legs and insulated at the apex, radiated in a field conforming to the figure "8". Greater directivity was achieved by later modification when one vertical and two inverted V aerials were inductively coupled to a spark-gap transmitter. The resultant radiation was confined to one side of the antenna. This system was to prove to be the forerunner of the movable beam. Bellini and Tosi so engineered the construction that the whole arrangement could rotate and very good results over distances extending up to 110 miles were obtained using a power expenditure of 500 watts.[104]

So it can be said, that by 1910, several aerial systems possessing some directive properties had been designed and of these the Bellini-Tosi arrangement approached nearest to the true beam effect. Already the foundations, phase opposition, multi aerials and reflectors, had been laid down for the evolution of the beam transmitting antenna. Unbeknown at the time, the massive stumbling block was the usage of long waves. Since it follows from the finding that antennae served best when cut to a resonant length,[105] all practical aerials were necessarily unwieldy.

Yet the advent of sure long range wireless communication was not to depend entirely upon the arrival of the beam antenna alone. Other factors were to prove important. When these factors were understood man was able to combine them with the properties of directional antennae to produce highly efficient beam wireless communication.

Effective long range directive wireless communication depends upon four factors:

1. The radiated power efficiency: calculated by comparing the amount of power generated with the amount of power radiated.
2. The frequency used: whether high frequency and short waves, or low frequency and long waves.
3. Characteristics of propagation of antenna used.
4. Properties of the medium of propagation.

As time progressed all four items received attention. It has been pointed out how various investigators worked at power efficiency and antenna radiation characteristics. The instance of frequency and wave length also received early consideration.

At first it had been assumed that only long waves could be used for long distance communication. This assumption, erroneous as it turned out to be, stemmed from Marconi's discovery that spark-gap apparatus was manipulated more easily during long wavelength generation. From this the wireless world followed the inference that long wavelengths were **best.** Indeed, the general viewpoint from the infancy of practical wireless until the early 1920's was that any wavelength below two hundred metres was useless for long range communication.[106]

For many years the utility of short waves was obscured by this opinion. They were not, in fact, used for wireless communication and, until they were, progress towards a convenient beam antenna was hardly practicable. Thus the discovery of the true directional or beam antenna hinged upon the discovery that short waves **could** be used for wireless communication.

Perhaps the one single factor which accelerated the discovery that short waves were **ideal** for communication was a resolution of the World Radio Congress held in London, 1912. This resolution, internationally agreed upon, limited the operation of amateur wireless stations to a frequency two hundred metres and below, official feeling being something like, "They'll never get out of their backyards with that!"[107]

So, while commercial interests concentrated upon long wave propagation with high power, the amateur, of necessity, experimented to achieve long range with waves "of less than two hundred metres, given to amateurs as one may give a toy to a child."[108]

Progress was made, and range developed from "the backyard" to five hundred miles and, by 1917, even one thousand miles. In 1921 two thousand miles had been covered. A demonstration of short wave communication was now planned. In this it was decided to span the Atlantic just as Marconi had done years before; only, this time, in the opposite direction.

An American, Paul Godley, arrived in the United Kingdom late in 1921 to try and detect amateur station signals emanating from the United States. Whilst in London he addressed the Wireless Society and ventured to say, "One has great hopes of being able to travel greater distances on shorter wavelengths."[109] His anticipation was fully rewarded when, at his receiving station in Scotland, between 8th and 17th December, 1921, he positively identified twenty-seven signals from America. Apart from the fact that these experiments opened up a new field of wireless communication research, they also served another purpose. This was to clearly show the advantage of valve oscillators generating continuous waves over the spark-gap transmitters. Thus these experimental transmissions heralded the approach of a new technique and the closure of another.

Further demonstrations of the utility of short wave propagation were forthcoming. In 1924 an English amateur operator made contact from his station 2OD with the United States, using only thirty-one watts power. This contrasted amazingly with the huge power expenditure necessary for long wave trans-Atlantic systems and commercial bodies began to take a keen interest in short wave techniques. This interest was heightened still more when in October 1924 the same amateur station was heard in New Zealand, a distance of 7,500 miles.

The short wave experiments had proved that whilst apparatus in the first place functioned better on long wavelength operation, this wavelength itself was not superior for long range wireless communication. It was realised from then on that previous trans-Atlantic wireless had succeeded in spite of the long wavelengths employed.

The development of the short wave technique of radio communication had a far-reaching repercussion on the development of the directional antenna, because "the shorter the wavelength and the higher the frequency, the smaller and cheaper the aerial and the more practical it is to direct its radiation."[110] It can be said that the opening of the short wave era was the first step towards finding the first really convenient highly efficient beam antenna.

Before the advent of the true beam antenna, however, divers uses were made of long wire aerials. The combination of long wire aerial and short wavelength, as used in the amateur test series, gave pronounced directivity in transmission.[111] Long wires can be combined to form various configurations that will increase directivity and apparent power gain. Such systems as the Bellini and Tosi were adaptable for short wave radiation with improved results. Indeed, the use of the said arrangement extended well into the 1950's. Modified forms were used on board European ships and the array was employed by American aviation for direction-finding purposes.[112] This last fact exemplifies the propensity of Bellini and Tosi's original research.

In 1928 the problem of directivity in wireless communication reached a further stage in its solution. The solution came in the form of a paper laid down by H. Yagi, of Japan, who postulated his theory on "Beam Transmission of Ultra Short Waves."[113] In the terms of

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[104] Ibid., p.666.

[105] In a resonant antenna the current flow is the largest possible and, as the field strength is directly proportional to current flow, greatest radiation occurs when the antenna is cut to a resonant length. The shortest resonant aerial is one half a wavelength long and this fundamental form is called a "dipole". When the antenna is more than one half wavelength long (but still an integral multiple of one half wavelength),, it is usually termed a "long wire antenna".

[106] Norris, Roy C.: "Radio Engineering": Odhams Press, London, 1944, p.202.

[107] American Radio Relay League: "The Radio Amateur's Handbook": Concord, New Hampshire, U.S.A., 1959, 36th edition.

[108] Words spoken by Sir Ambrose Fleming. Radio Society of Great Britain: Journal, Vol. 39, No. 1, July 1963, p.27.

[109] Radio Society of Great Britain: op. cit., p.27.

[110] Scroggie, M. G.: "Foundations of Wireless": Iliffe and Sons Ltd., London, 1960, new impression, p.198.

[111] A long wire antenna is one which is long in terms of the transmitted wavelength and it does not exclusively mean a straight wire aerial.

[112] Nilson and Hornung: op. cit., p.378.

[113] Kraus: "Antennas": McGraw-Hill Book Company, New York, 1950, 1st edition.

his theory, which Yagi mathematically proved, radiation could be sharply beamed in the one direction by out-of-phase excitation of the various elements of a compound antenna.

Yagi's beam antenna centred around one element which was directly connected to the transmitter. In front of this element he placed a number of shorter elements called directors. Behind the driven element, that is, the one directly connected to the transmitter, he situated larger elements called reflectors. In such an array the current of the reflector and director aerials added up in phase in the desired direction and cancelled out in the undesired direction.

The operation of Yagi's system is akin to the principle of Braun's 1906 "out-of-phase" excitation of three vertical antennae, but the Yagi system is simpler, less unwieldly and relatively inexpensive. Today's adaptation of the Yagi idea forms the modern answer to beam transmission and reception. By increasing the number of driven elements and by suitably arranging them side by side, or, in stacks one on top of the other, radiation can be concentrated into an intense and very narrow beam indeed. In these days of multitudinous signals in a limited spectrum space this consideration is of ultimate importance.

The earlier investigators had been puzzled by the fact of long range wireless communication. They searched to answer the problem of how it was that electro-magnetic waves, which travel in straight lines, could be detected beyond the horizon of the earth's rounded surface. The quest for the answer has resulted in the gradual accumulation of knowledge about the propagation medium and its effect upon the emitted wave.

Admiral H. B. Jackson, R.N., made systematic observations on the effects of varying conditions of the atmosphere on the effective distance working of electric wave telegraphy in 1902.[114] In particular he dealt with transmission over the sea, and his findings included the phenomena of the gradual weakening and the occasional total cessation of a signal as the distance between two ships increased, and then its re-appearance as the distance between the ships still further increased.

It seems possible that Admiral Jackson was the first to record the "ground wave effect" noticeable when a receiver is within close range of the transmitter. It is very likely that the blank zone where no signals were detected corresponds to what is now termed the "skip zone", and that the signals received after this were "sky waves".[115] Admiral Jackson did not hint at the possibility of the conduction of emitted waves by the upper atmosphere but, in the same year, at almost the same time, such a suggestion was made. Kennelly, of America, and Oliver Heaviside, of the United Kingdom, were the two men concerned. Heaviside's words could speak for both: "There may possibly be a sufficient conductivity layer in the upper atmosphere. If so, the waves will, so to speak, catch on to it more or less."[116]

[114] Admiral Jackson's report is quoted in Fleming: op. cit., pp.813-822.

[115] These terms came into use long after Admiral Jackson's observations.

Marconi, in 1902, during his Atlantic voyage on board the S.S. Philadelphia, had noticed that signals could be received at night whereas they could not be detected by day. These events led him to propose that the shortening of range during the day was due to the weakening of the wave energy caused by the action of daylight upon the transmitting antenna.

As trans-Atlantic wireless telegraphy developed, hundreds of observations on day and night variance led to the analysis that regularly, for periods at sunrise and sunset, waves of 12,500 ft. were very strong whereas the longer regular wave of 14,700 ft. was near-undetectable. By 1909 it was a well-established concept that it was ionisation of the atmosphere by sunlight that was causing these variations. The explanation offered was that sunlight made turbid the conduction layer and so it absorbed the long wave. The weakening effect was at first overcome by simply increasing power for daylight transmissions. This solution was based on the belief that refraction alone accounted for the bending of long electro-magnetic waves around the earth's surface.

A departure from the acceptance of refraction as a total explanation for long distance wireless communication was advocated by Dr. J. W. Nicholson in 1910. He contended that other causes, "such as reflection from a layer of ionized air at high altitudes,"[117] must be the reason for the deflection of electro-magnetic waves around the global surface. Such reflection had been suggested by Marconi in his Nobel Prize lecture the year previous to this, and Professor J. A. Fleming also considered "that there is something of the nature of a reversed mirage effect, in virtue of which the waves are deflected round the earth by the reflective action of highly ionized layers of air in the upper atmosphere."[118]

The substantiation of the existence of a conductive layer came in 1925 upon the production of proof by Dr. E. V. Appleton. He showed that the conducting layer suggested by Kennelly and Heaviside consisted of several layers at various heights. One layer at 100 km. was named the Kennelly-Heaviside layer, and two others at 220 km. and 300 km. above the earth were called the Appleton layers.

It was found that these layers did indeed act as a mirror and reflect wireless waves back to earth. Furthermore, the waves may reflect between earth and layers many times and hence came the reason why long range wireless communication was possible.

The density and height of the layers alter from time to time because of the action of sunlight upon **them**, and not upon the **antenna** wire as Marconi had suggested. Due to alteration in height of the relevant reflecting layer, the radiated waves struck at differing angles and thus would be reflected and returned to earth at a different point, hence the evidence of variable conditions for reception near sunrise and sunset noticed since the beginning of long range wireless communication.

[116] Lee: op. cit., p.14.

[117] Fleming: op. cit., p.829.

[118] Ibid., p.830.

The long waves used in the early pioneering days were found to be especially susceptible to reflection by the lower layers with a high rate of absorption; hence when Marconi stepped up the power radiated, increased signal strength resulted. Short waves, it was discovered, penetrated the lower layer and rebounded from the higher layers where less absorption and height variation occurred; hence their strength when the long waves weakened due to alteration of layer.

Further research by two experimenters, Breit and Tuve, was made in 1926. This duo developed a system called the "pulse method" which proved a most useful means of determining the different heights of the various conduction layers surrounding the earth.[119]

Breit and Tuve's work initiated continuous investigation and, as techniques developed, automatic electronic equipment was placed at different parts of the world. As a result of this accumulation of experience over the years, it is possible to fairly accurately predict the condition of layers for some months ahead. Thus, if the height and density of the layer are known, the best frequency for beam transmission to a distant point can be selected. Then the beam from the directive antenna will radiate in a narrow beam and at the correct angle for reflection to the desired reception point. In other words, maximum benefit of power radiated will result.

(To be continued.)

[119] Breit and Tuve transmitted a short pulse of electro-magnetic energy which was received as a signal with an echo because of the difference in time of radiation over the sky and ground wave paths. From this data they calculated the equivalent height of the reflecting layer and the equivalent path of the sky wave.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer. No.	C'ntries	Call	Cer. No.	C'ntries
VK5MS	24	314	VK2ADE	65	231
VK5AB	45	312	VK2JZ	61	227
VK6RU	2	307	VK6KW	4	211
VK6MK	43	303	VK3WL	14	211
VK3AHO	51	299	VK4HR	12	208
VK4FJ	21	283	VK3ATN	26	204
Amendments:					
VK2AAK	58	200	VK3TG	48	135

C.W.

Call	Cer. No.	C'ntries	Call	Cer. No.	C'ntries
VK3KB	10	328	VK2AGH	71	274
VK3CX	26	305	VK6RU	18	262
VK2QL	5	301	VK2EO	2	255
VK4FJ	29	300	VK3AHQ	79	254
VK2ADE	81	298	VK3ARX	66	250
VK3NC	19	286	VK3YL	39	240
Amendment:			**New Member:**		
VK3RJ	42	227	VK3SR	82	133

OPEN

Call	Cer. No.	C'ntries	Call	Cer. No.	C'ntries
VK2ADE	28	322	VK2ACX	6	300
VK6RU	8	312	VK3NC	77	287
VK4FJ	32	308	VK3JA	43	271
VK6MK	74	305	VK4HR	7	254
VK2AGH	83	305	VK2VN	18	247
VK3AHO	76	303	VK7LZ	23	242
New Member:					
VK2SG	95	127			

T PADS FOR R.F. CIRCUITS*

KEN "JUDGE" GLANZER, K7GCO

RADIO frequency T pads have many uses, particularly as attenuators between exciters and linear amplifiers. The amount of desired attenuation between the exciter and final depends on how much power is needed at the final grids, the efficiency of the grid circuit and the excess power of the driver. With a T pad in the line the exciter can be loaded at or near its full output while not overloading the final grids so that when the grid impedance changes (when the final goes from AB1 to AB2), the impedance change reflected back to the driver is reduced by the number of dbs. of loss inserted by the T pad. The driver then essentially sees a constant load.

The T pad has other uses such as between exciter and low power s.w.r. bridges, at the input to a field strength meter in case of strong fields, or on the output of signal generators.

T PAD DESIGN

The circuit of a T pad is shown in Fig. 1. Also shown are the circuits of H pads which can be used for balanced lines. However, in most instances the T pad is usable and simpler.

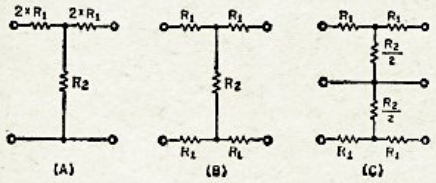


Fig. 1.—The T pad shown in (A) is suitable for most attenuation circuits, but the H pads in (B) and (C) are used for balanced lines.

A chart for determining the value of resistances needed for any particular value of db. attenuation is shown in Table 1. Since the chart values are for a 500 ohm impedance, to determine the resistance value for a 52 ohm pad each value must be multiplied by 52/500 or 0.104. For a 72 ohm pad the factor is 0.144.

For example, to calculate a 6 db. attenuator (which results in a power loss of 75%) look up the 6 db. loss on the chart which shows resistance value for R1 as 83.08 ohms and 669.4 ohms for R2. Now multiply each value by 0.104 to convert it to 52 ohm impedance values.

The value for R1 is now 8.64 ohms and R2 69.6 ohms. However, according to Fig. 1, the T pad configuration employs values of 2 × R1 and thus the values shown in Fig. 2 are required.

Fig. 2.—The 6 db. pad, calculated as an example in the text, is shown herewith.

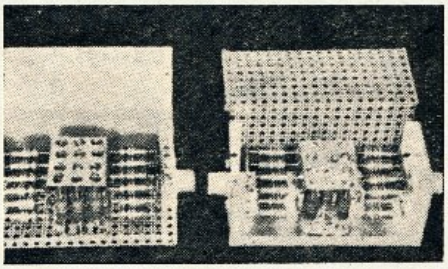
Loss in db.	R1	R2
0.1	1.440	43420.0
0.2	2.878	21720.0
0.3	4.318	14480.0
0.4	5.758	10850.0
0.5	7.193	8685.0
0.6	8.635	7232.0
0.7	10.07	6198.0
0.8	11.51	5421.0
0.9	12.95	4818.0
1.0	14.38	4333.0
2.0	28.65	2152.0
3.0	42.75	1420.0
4.0	56.58	1049.0
5.0	70.03	822.4
6.0	83.08	669.4
7.0	95.65	558.0
8.0	107.7	473.1
9.0	119.1	405.9
10.0	129.9	351.3
15.0	174.5	183.6
20.0	204.5	101.0
25.0	223.5	56.40
30.0	234.7	31.65
35.0	241.3	17.79
40.0	245.1	10.00

Table 1.—**Pad Resistor Values**

PAD VALUES

The first problem in construction of the T pad is to find carbon resistors of sufficient power rating and of proper resistance value. The easy way out is to use 2 watt carbon resistors (10%) paralleled to develop the precision resistance values that will be required and at the same time to build up the power dissipation capabilities. The method of mounting the resistors to keep the T pad as resistive as possible was suggested by W7JNC and is shown in the photograph.

The first step is to determine how the desired values of resistance can be arrived at. In the example being discussed a value of 18 ohms can be obtained by paralleling ten 180 ohm resistors. The 69.6 ohm resistor bank was made up of ten 680 ohm resistors. (Eleven 750 ohm resistors would have given 2 watts more dissipation to that leg and left the twelfth hole for a parallel correcting resistor if it was necessary.) In actual practice, due to resistor tolerances, there will be some variation. Since the mounting plates will hold twelve resistors, this allows room for paralleling another resistor if final value is above 18 or 69.6. The actual values obtained were 18.1, 17.95, and 79.45. For all practical purposes this is close enough but if it is desired to have it exact, measure all three arms of T pad with an accurate resistance bridge or ohm-meter and add a correcting resistor.



View of the 6 and 3 db. T pad attenuators designed for 52 ohm co-axial cable.

The method of determining the required value of the correcting resistor R_x, for each branch, employs the parallel resistor formula:

$$R_T = \frac{R1 \times R_x}{R1 + R_x}$$

Solving for R_x, we get

$$R_x = \frac{R_T \times R1}{R1 - R_T}$$

where: R_x = Unknown parallel resistor required.
R_T = 17.28 ohms (desired value).
R1 = 18.1 ohms (actual value).

Thus—

$$R_x = \frac{17.28 \times 18.1}{18.1 - 17.28} = \frac{312.7}{0.82}$$

R_x = 381 ohms.

Therefore a parallel resistor of 381 ohms would lower the final value of the 18.1 resistance to 17.28. The value needed in this case for the 17.95 branch was 462 ohms.

The resistance values required for a 3 db. pad are 8.9, 8.9, and 147.8 ohms. Eleven 100 ohm resistors connected in parallel should give 9.1 ohms and twelve 1,800 ohm resistors should give 150 ohms. The actual values obtained were 9, 9.1 and 161 ohms. The parallel correcting resistors are (in this case) 801, 396 and 1,800 ohms. The first two were installed in the 12th hole but the 1,800 ohm resistor had to be squeezed in as all 12 holes were used.

T PAD HOUSING AND ASSEMBLY

The two T pads, the 6 and 3 db. units, are each made in one half a Bud box 2¼" x 2¼" x 5". This Bud enclosure was particularly suited for this application and as shown in the photo one half of the box contains the pad and the cover is made from perforated aluminium. The second pad ultilises the other half of the box and more perforated aluminium for ventilation.

The co-ax jacks are first mounted in the middle of the end pieces of the box. The four copper pieces are cut, drilled and bent, as shown in Fig. 3. The resistor leads are trimmed to ⅜" and are now soldered to the bottom plate as shown in Fig. 4. With the top leads trimmed to 5", the U sheet is soldered to the vertical resistors.

(Continued on Page 17)

* Reprinted from "CQ," July, 1964.

RESULTS OF 1964 R.D. CONTEST

SOUTH AUSTRALIA WINS CONTEST

HONOURS for the Remembrance Day Contest go to South Australia with a truly excellent score which put them well in front of their nearest rivals. It was generally agreed by the contestants that the band conditions were not as good as in previous years and most of the night time activity was confined to 80 metres and to a lesser extent to the 40 metre band.

Advice has been received from Federal Executive that VK1 and VK8 are to be shown as separate call areas in the future. Consequently the 1965 Contest rules will be amended accordingly.

Some correspondence has been received regarding the greater participation of Limited Licensees in the Contest as the v.h.f. bands are rarely open for Interstate contacts at this time. Therefore very few Limited Licensees are able to participate, the exception being those who are located close to neighbouring States. It is understood that in one State a v.h.f. Contest was held at the same time as the Remembrance Day Contest. We would like to hear any suggestions (apart from those who have already written) from Amateurs interested in this matter, in order that the 1965 Contest will see some changes in this direction.

Finally, our congratulations once again to South Australia for a splendid effort and hope that the coming Contest will receive the same support that the previous ones have had.

——Federal Contest Committee, W.I.A.

DETAILS OF STATE SCORES

	Total State Score	Aver. Top Logs	Licensees	Log Entry	Percentage.	State Log Aver.	**Total State Points**
New South Wales	12,686	628	1,293	89	6.9	142.5	1,501
Victoria	13,819	684	1,078	66	6.1	209.2	1,530
Queensland	11,673	671	397	87	21.9	134.1	3,229
South Australia	19,521	914	452	111	24.5	175.8	5,707
Western Australia	8,767	455	255	82	32.1	106.9	3,274
Tasmania	4,519	384	120	38	31.6	119.0	1,815

STATE TROPHY

South Australia .... 5,707 points

Highest State Log Average

Victoria .... 209.2 points

Highest Individual Score

VK5ZP .... 1,270 points

Award Winners

Open—

VK1RD—R. Davis	373	pts.
2BO—E. L. Andrews	607	„
3ALZ—I. F. Berwick	843	„
4RH—A. L. Hoey	920	„
5ZP—J. McL. Vale	1,270	„
6CL—I. H. Clinch	560	„
7DK—D. H. Kelly	376	„
9XI—Rabaul Amateur Radio Club	131	„

Phone—

VK1QL—J. L. Weatherley	371	pts.
2AHM—R. J. Whyte	1,089	„
3MO—I. J. Williams	965	„
4DA—M. J. Swaby	678	„
5ZK—G. H. Herden	1,111	„
6LR—L. G. Rock	520	„
7KH—K. A. Hancock	402	„
8KK—D. A. McArthur	322	„
9AG—A. G. Nunn	35	„
0PK—P. King	516	„

C.w.—

VK2QL—F. T. Hine	519	pts.
3AXK—S. R. Coleston	383	„
4JF—J. Files	230	„
5ZC—A. J. Penney	347	„
6WT—D. Couch	374	„
7SM—S. G. Moore	485	„
8UX—L. W. Wallbridge ..	14	„
9GC—A. H. Sandilands ..	116	„

Receiving—

VK1—A. Davis	651	pts.
L2033—D. W. Shephard	420	„
L3138—G. N. Earl	832	„
VK4—W. Thorpe	662	„
L5065—A. F. Raftery	821	„
L6021—P. W. Drew	1,115	„
VK7—G. C. Johnston	908	„

AUST. CAPITAL TERRITORY

Open—

Call	Cont.	Pt.
VK1RD	161	373
1GB	86	190
1VK	31	68

Phone—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK1QL	149	371	VK1LF	16	45
1VP	69	170	1SB	12	33
1KM	40	83	1DR	9	19
1ATR	23	55	1CR	8	14

NEW SOUTH WALES

Top Six Logs—

VK2AHM	1,089 points
2BO	607 „
2TS	606 „
2QL	519 „
2DO	506 „
2VN	442 „

Open—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK2BO	232	607	VK2HC	54	122
2DO	209	506	2CK	62	121
2XU	151	364	2EL	51	113
2AGH	117	332	2APO	59	107
2SU	103	274	2IC	26	63
2OO	95	218	2HZ	20	52
2DR	100	210	2AUC	16	23
2PU	78	169	2IV	8	18
2AJQ	62	122			

Phone—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK2AHM	399	1,089	VK2AKX	43	81
2TS	263	606	2XA	31	76
2AKF	166	422	2AQJ	35	72
2AFT	171	416	2AIM	22	61
2ACQ	87	242	2VJ	30	53
2ALV	202	236	2SJ	37	46
2BB	102	227	2AKL	17	33
2ZX	100	224	2RU	27	33
2XT	59	197	2SG	9	32
2ASI	75	166	2CU	6	27
2AOK	70	161	2BJO/P ..	16	26
2AXJ	71	154	2ADL	6	23
2ACZ	62	152	2RJ	10	23
2MR	40	147	2GV	10	20
2CM	40	147	2ATZ	11	18
2MW	61	121	2UU	6	15
2LA	43	114	2APQ	10	15
2AIA	38	112	2EY	9	15
2VH	49	110	2AKV/M .	8	14
2GI	44	114	2AWX . ..	9	14
2AZG	42	97	2OE	10	13
2OX	43	87	2AND	6	6

C.w.—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK2QL	189	519	VK2QZ	23	87
2VN	150	442	2PQ	40	78
2EO	141	418	2JM	20	48
2APK	154	413	2AXK	12	38
2QK	117	334	2BGG	11	34
2GT	114	319	2GW	12	31
2YB	120	303	2ATQ	11	25
2ZO	47	106	2AAH/M .	7	23

VICTORIA

Top Six Logs—

VK3MO	965 points
3ALZ	843 „
3ATN	634 „
3ARD	611 „
3XY	583 „
3RV	469 „

Open—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK3ALZ	300	843	VK3KC	89	162
3QV	120	363	3AIY	51	94
3XB	129	338	3KS	18	74
3KB	97	224	3PG	13	23

Phone—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK3MO	353	965	VK3GC	84	217
3ATN	200	636	3VZ	82	203
3ARD	234	611	3NN	63	203
3XY	230	583	3AHT	86	200
3RV	173	469	3WW	86	181
3AIT	201	424	3AMT	92	179
3ACI	188	375	3BA	88	176
3ASN	153	341	3ACD	57	158
3EF	127	311	3AUK	69	140
3ARJ	114	310	3AKZ	54	133
3ZU	134	296	3HC	52	122
3WB	129	294	3AZM . ..	42	120
3EG	123	292	3AHA	60	119
3AWT	131	285	3AWD	50	105
3ABP	116	252	3YQ	44	102
3SM	115	245	3SX	42	99
3ZX	86	222	3WM	31	98
3WK	85	221	3QZ	33	63

Phone (cont.)—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK3DY	30	59	VK3RN	21	39
3AKJ	32	54	3OR	19	38
3AWV	21	52	3AFL	11	33
3DU	21	50	3AAC	11	20
3AR	24	41	3OH	10	19

C.w.—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK3AXK	173	383	VK3ZC	41	100
3RJ	111	271	3AWM	39	82
3APJ	105	233	3AND	37	62
3ARX	60	147	3HE	20	48
3HP	64	146	3AFQ	22	42
3QP	56	104	3YS	9	17
3SR	36	102	3NI—Check Log		

QUEENSLAND

Top Six Logs—

VK4RH	920	points
4DP	746	,,
4DA	678	,,
4BQ	669	,,
4UX	511	,,
4MW	506	,,

Open—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK4RH	343	920	VK4FJ	22	65
4DP	278	746	4RB	21	55
4UX	190	511	4RE	27	45
4DB	108	239	4GG	18	22
4UC	89	161	4QF	14	19
4PX	38	101			

Phone—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK4DA	292	678	VK4PU	18	50
4BQ	219	669	4AV	9	47
4MW	201	506	4JW	15	45
4OR	160	482	4ZZ	19	44
4LT	180	478	4GS	19	41
4RZ	165	405	4ZB	9	40
4XY	142	404	4NS	20	40
4WW	152	390	4LW	28	40
4ES	128	302	4QC	25	38
4FY	117	259	4BA	17	36
4PS	89	257	4ZW	20	36
4LN	102	252	4LA	27	33
4JI	115	220	4KS	10	30
4WP	68	165	4LB	9	29
4RO	60	164	4RW	12	29
4FE	61	146	4CI	14	28
4FK	38	120	4JE	7	26
4EH	32	112	4JJ	15	29
4JM	56	103	4SF	12	21
4HC	56	102	4GT	5	17
4HR	31	99	4ZM	6	17
4OF	53	97	4BZ	12	17
4AN	44	89	4CW	6	16
4LE	33	80	4XN	8	14
4QW	36	73	4RG	9	14
4UL	25	65	4AF	6	12
4OV	26	63	4VS	6	11
4DZ	42	59	4NG	6	9
4DO	20	57	4HZ	7	9
4PJ	33	57	4PR	6	7
4NE	20	52	4FT	6	6
			4UK	6	6

C.w.—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK4JF	95	230	VK4SD	13	45
4XP	73	179	4XJ	10	39
4HH	64	125	4CK	21	38
4KU	37	90	4ON	11	19
4VR	25	68	4CN	7	8
4WO/P	26	53	4UU	5	6
4KX	25	47			

SOUTH AUSTRALIA

Top Six Logs—

VK5ZP	1,270	points
5ZK	1,111	,,
5BQ	904	,,
5RG	791	,,
5GZ	771	,,
5FT	635	,,

Open—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK5ZP	460	1,270	VK5WV	111	280
5RG	315	791	5KI	106	211
5CV	162	517	5QR	77	190
5WO	133	449	5RK	15	79
5TC	154	395	5HM	15	59
5EJ	162	321	5NH	28	50

Phone—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK5ZK	404	1,111	VK5NY	55	91
5BQ	321	904	5JC	24	86
5GZ	302	771	5WL	19	84
5FT	223	635	5GX	34	82
5GW	202	549	5LN	33	78
5MF	181	459	5KE	15	72
5EF	154	416	5CJ	29	71
5GV	158	409	5LZ	27	63
5NN	157	357	5FO	29	61
5BP	126	299	5KS	30	60
5KM	124	296	5ZKR	6	56
5CD	112	286	5UF	28	55
5OH	110	280	5CH	16	53
5IB	91	270	5OK	21	50
5EQ	74	254	5OC	15	49
5SX	109	216	5KY	12	45
5BG	66	204	5CY	31	44
5DF	67	196	5ZQ	13	44
5MC	90	194	5IQ	10	43
5TJ	63	188	5PM	30	42
5LC	71	187	5FM	14	42
5AX	101	182	5GO	17	39
5KC	73	179	5TU	23	38
5RR	67	177	5DJ	22	37
5TM	67	163	5RT	20	37
5SS	77	162	5JK	10	33
5ZE	64	161	5DO	12	31
5LQ	39	161	5LO	10	30
5FL	39	152	5ZK/Log		
5ID	58	132	5WI	7	27
5ZZ/T	61	115	5MS	11	26
5BB	28	113	5PS	13	23
5WN	39	110	5JA	10	23
50B	30	105	5GF	11	16
5DA	30	98	5BI	12	14
5DC	45	96	5JB	6	13
5CO	28	94	5WW	10	11
5XL	51	92	5NF	8	10
5CL	44	92			

C.w.—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK5ZC	143	347	VK5KO	22	59
5XK	121	320	5MY	19	47
5LD	108	275	5FY	16	47
5PC	108	255	5TL	20	43
5FE	70	195	5BS	20	41
5ZF/P	54	154	5RX	10	39
5OR	63	135	5KU	13	31
5GP	38	91	5JG	12	30
5MZ	31	79	5RH	9	25
5JT	22	78	5BM	6	8
5JE	27	66			

Disqualified Log VK5NO/Port. VK2.

WESTERN AUSTRALIA

Top Six Logs—

VK6CL	560	points
6LR	520	,,
6SM	429	,,
6RY	427	,,
6KN	423	,,
6WT	374	,,

Open—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK6CL	218	560	VK6JK	57	150
6SM	164	429	6WI	36	83
6WU	89	276	6HK	16	40
6VK	75	185	6BA	13	27
6RU	60	177			

Phone—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK6LR	190	520	VK6CW/Log		
6RY	171	427	6CN	20	57
6KN	161	423	6NJ	24	57
6XX	134	340	6KJ	23	54
6WL	117	308	6LM	17	51
6CW	113	277	6CR	20	50
6RX	108	256	6RU/Log		
6AV	91	240	6AE	19	50
6WV	65	176	6WY	16	47
6CA	61	173	6LR/Log		
6HH	57	171	6LK	15	47
6VF	60	160	6BR	17	45
6MM	51	137	6CP	16	45
6KH	43	117	6DC	16	44
6DX	40	105	6XO	16	40
6XG	36	98	6TM	17	39
6RW	32	91	6JO	16	38
6TB	31	86	6GJ	16	38
6AF	32	81	6KW	16	37
6RY/Log			6GJ/Log		
6NN	34	79	6CA	12	36
6YL	28	77	6VM	15	36
6EZ	21	73	6DP	9	33
6MO	27	71	6WG	11	33
6DT	26	68	6GL	12	32
6KS	24	65	6DC/Log		
6TK	25	63	6LF	10	29
6TY	21	58	6MK	12	28
6BU	24	57	6FX	12	28

Phone (cont.)—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK6CD	11	28	VK6BS	8	19
6ZW	9	22	6TX	6	18
6SN	8	22	6AG	7	15
6VW	9	21	6MR	7	14
6AW	7	20	6GB	5	12

C.w.—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK6WT	144	374	VK6EB	8	22
6RS	89	230	6AS/Log		
6AS	29	70	6GA	6	16
6QJ	27	54	6KV	7	14
6UF	12	28	6BF	6	12
6ZO	11	27	6WW	6	11

TASMANIA

Top Six Logs—

VK7SM	485	points
7KH	402	,,
7SF	389	,,
7DK	376	,,
7ZZ	364	,,
7JF	287	,,

Open—

Call	Cont.	Pt.
VK7DK	191	376
7ZZ	150	364

Phone—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK7KH	163	402	VK7JD	14	26
7SF	165	389	7LE	7	26
7JF	112	287	7AL	7	22
7BR	122	267	7MC	15	22
7IL	131	255	7DR	6	18
7AI	55	185	7KS	13	18
7XL	55	133	7BT	14	18
7EB	38	84	7DS	7	17
7ZW	49	75	7NZ	8	12
7TT	33	66	7DA	6	12
7BB	27	57	7MX/Log		
7DW	28	49	7MS	7	12
7YL	23	47	7BQ	6	10
7MX	26	44	7MX/Log		
7KC	17	39	7LR	7	7

C.w.—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK7SM	179	485	VK7JB	46	109
7GV	99	217	7BJ	10	27
7GK	60	164	7KA	10	22
7RY	60	134	7LJ	10	22

NORTHERN TERRITORY

C.w.—

Call	Cont.	Pt.
VK8UX	8	14

Phone—

Call	Cont.	Pt.
VK8KK	119	322

PAPUA/NEW GUINEA AND TERRITORIES

Open—

Call	Cont.	Pt.
VK9XI	31	131

Phone—

Call	Cont.	Pt.
VK9AG	11	35

C.w.—

Call	Cont.	Pt.	Call	Cont.	Pt.
VK9GC	37	116	VK9CJ	29	60
9DR	37	104	9NM	10	21

Invalid Log VK9MV

ANTARCTICA

Phone—

Call	Cont.	Pt.
VK0PK	86	516

RECEIVING SECTION

Australian Capital Territory

A. Davis ..... 651 points

(Continued on Page 18)

Book Review

RADIO AMATEUR'S HANDBOOK
1965 Edition

This handbook is known the world over as "The standard manual of Amateur communication." For a number of years the annual revisions appear to have been carried out with a minimum of new material. Perhaps this was due to a temporary lull in technical progress.

Techniques, in the communications field, have been relatively stable and only detailed improvements were possible in many areas. Remember the claims for receiver sensitivity, 1 μV. during the '30's and '40's, the latest $\frac{1}{2}$ μV. There have, of course, been many other developments and far too few of those old receivers are usable on sideband without extensive modification.

C.w., s.s.b., r.t.t.y. Phone (a.m., f.m.) or whatever you need, they are all there.

A number of new transmitters and receivers are described in this edition, breaking the receiver description drought.

It is noticeable that the Americans now admit that components are made outside the U.S.A., for they have discovered Eddystone dials and Jackson variable capacitors—both from the U.K.

Solid state devices are steadily moving into the Amateur field—and all others also. Amateurs first described transistor receivers some years ago, but they are apparently not yet capable of a standard of performance warranting their inclusion in "the handbook."

Semi-conductor devices have now been reduced in price to such an extent that transistor equipment is being offered by a number of makers. National recently announced their HRO-500 "all solid state receiver" at $1295, with 45% duty and 25% sales tax—you must expect to pay over £1,200 for this receiver in Australia.

There are places where semi-conductors have even been used successfully for years and no doubt it will not be long before all solid state h.f. and even v.h.f. and u.h.f. gear will be available to Amateurs. Commercial s.s.b. equipment is available with solid state receivers, s.s.b. transmitters with only two tube stages and one American maker recently announced a 75 watt p.e.p. (output) transceiver using solid state devices only. I have no doubt that when transistors and other solid state devices become so reliable and circuits reproducible under Ham conditions then, I feel sure, that you will find the A.R.R.L. Handbook and "QST" will give them as much space as they warrant.

Published by the American Radio Relay League, Newington, Connecticut, U.S.A. Australian price, 58/6 (postage 2/6). Our copies, McGill's Authorised Newsagency, 183-5 Elizabeth Street, Melbourne, C.1, and Technical Book & Magazine Co., Swanston Street, Melbourne, C.1.

YOUTH RADIO CLUBS

Encouraging news from VK3 comes in the Newsletter from Ken 3TL (of DX-pedition fame). A total of 16 clubs are already moving — Australian Postal Institute, Burwood Teachers' College, Caulfield Grammar, Edmund Rice College, Geelong Grammar, Gowrie Park, Greythorne, Korumburra, Macleod, Institute for the Blind, Scotch College, St. Anne's, Strathmore, Warrnambool Tech., Wonthaggi Tech., Yallourn Tech. Two Junior Certificates at Wonthaggi Tech.—Graeme Atkinson and Peter Bond. Front page publicity for the girls at St. Anne's in "A.R." should encourage more girls. Ken Stone at Korumburra reports present projects include a Geiger Counter, Electronic Stroboscope, and a 4-valve Rx, that Barry Douglas is to carry on as Instructor, and that Robert Stewart is attending the Technician-in-Training Course with the P.M.G. Caulfield Grammar have some boys ready for Junior Certificate. K. Phillips and Robert Stewart of A.P.I. have become Associate Members of W.I.A., and three past members of the club, John Liversy, David Jones and John Lyle, have passed A.O.L.C.P. Harry 3HC of Aegis Manufacturing has donated about 1000 knobs for YRS equipment. Finally, Ken makes a good point by enclosing a card on Mouth-to-Mouth Resuscitation. Club leaders should be specially conscious of safety. There should be rigorous training on avoidance of danger and just as rigorous training on correct treatment in case an accident does occur. Nothing in your work is more important than this.

Loads of news from VK2 as usual. Main item is the award of the I.R.E.E. Pennant for 1964 to Westlakes Club under Keith 2AKX and well deserved. Keith also gets the first Radio Instructor's Certificate (Grade 2). He has helped 17 Elementaries, 4 Juniors, 5 full A.O.C.P., one Limited A.O.C.P., and one still to do Regulations. Westlakes has a modern air-conditioned studio in the club and handles the Newcastle Zone broadcast. They have six lady members. A Field Day will be held during Queen's Birthday week-end, night lamp signalling is practised (up to five miles!) and they intend carrying on with "Electronics by Radio" in June. The Dunrossil Memorial Lecture by the Duke of Edinburgh to the I.R.E.E. was attended by Roger 1RD, Jim, 1JR and Joe 2ZMM. The boys conversed briefly with the Duke and enjoyed this well-organised professional affair. The boys were introduced among the V.I.P. visitors and rightly. Thanks for donations are due to Mrs. J. Moyle, Roger 1RD, Reg 2AI, Pearce 2APQ, Barry Harword, R. Jakimov. R.A.A.F. proposes to absorb two intakes of Radio Apprentices during 1965 for installations and maintenance connected with the new American aircraft—club instructors please note and pass on. Doug Williamson (in charge of Elementary Certificate matters) has been transferred to Miller High (near Liverpool). The I.S.C.F. Camp Technology at Mt. Victoria was a great success. Boys came from all over N.S.W. to a camp well staffed with technicians and the Electronics group engaged in projects ranging from Amateur Radio contact through Tom 2AWM and Bruce 2BG to the construction of amplifiers and transistorised flip-flop circuits, etc. Why not more of this everywhere? Bruce Mitchell, Club Leader at Y.M.C.A. in 1964, has moved on to Teachers' College after a successful year. This leaves Y.M.C.A. without a leader for 1965 on Saturday mornings. What a pity if this steady group has to fold up—is there a volunteer?

Sorry I can't mention other Divisions. I know 4 Uncle Charlie will be on the job and I can only hope 5, 6 and 7 are building their future. 73, de IKM.

☆

YLs IN SYDNEY

We recently had a visit from Aleen VK6YL and her OM Bill VK6RX. The Sydney YL's—VK2AOK, VK2AXS and VK2AIA—entertained them for lunch at the QTH of VK2AIA and everyone had a most enjoyable time. It is always interesting to meet "voices" face to face and we hope to have the same pleasure with other YL's and their OM's.

All YL's are advised that an open invitation is extended to anyone visiting Sydney to contact Hebe VK2AOK when arrangements will be made for a get-together.

T PADS FOR R.F. CIRCUITS

(Continued from Page 13)

Next, solder two resistors in the right and left corner of one side with the resistor leads trimmed to about 3/16". Then slip on the end sheet and note where the centre post of the co-ax touches. Be sure the resistors are horizontal and then mark the contact point. Drill the co-ax connector hole and mount and solder the rest of the resistors and also the connector pin.

Repeat the procedure for the other end of the T pad.

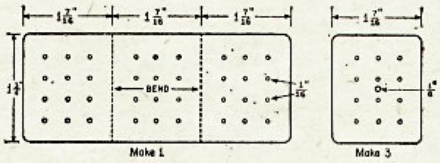


Fig. 3.—Dimensions for the copper sheet end, bottom and centre connectors. The bottom and the two end plates are identical.

GENERAL

When using the 6 db. pad with 100 watts input (25 watts output) to drive the grids of a final amplifier there is about 33 watts dissipated in the input 17 ohm section and 8 watts in the other. About 34 watts will be dissipated in the 69 ohm branch. Since the power dissipated is not continuous for a.m. and even less on c.w. and s.s.b., the pads handle 100 watts s.s.b. or a.m. input quite well.

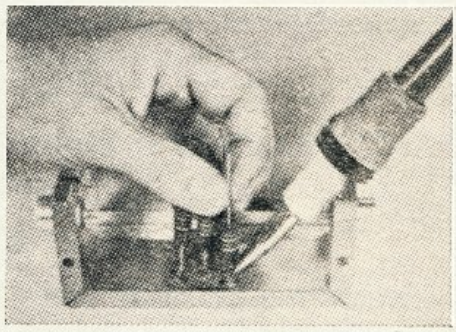


Fig. 4.—Method used to solder the resistors to the bottom plate. The shorter the resistor leads the better.

Six db. is about the maximum for a 100 watt output rig driving tetrodes with multiband tuners. The inefficiency of the grid circuit on 10 metres is the maximum db. design consideration. The unique construction of the pads makes them almost purely resistive even at 10 metres.

The copper plates also act as heat sinks. For even greater dissipation capabilities the T pad can be mounted in a sealed can of oil.

The pads can also be used for audio work and the 500 ohm impedance of the design chart given in Table 1 can be shifted by calculating the multiplying factor required in the exact same manner. ●

NEW CALL SIGNS

JANUARY, 1965

VK1BE—E. B. Britton, 27 Galway Place, Deakin.
VK1DD—D. R. L. Davies, 4 Westgareth St., O'Connor.
VK1EP/T—E. Piraner, 4 Steel St., Hackett.
VK1GI—I. Grant, 12 Selwyn St., Hackett.
VK1ZJL—J. Lauten, 28 Atherton St., Downer.
VK1NC—J. D. Blalock, 7 Dawson St., Curtin.
VK2UO—A. L. Steward, 58 Myall St., Oatley.
VK2BAS—E. W. Bastow, 33 Essilia St., Collaroy Plateau.
VK2BDM—D. A. McCansh, C/o. Yarrawonga Station, Cobar.
VK2BHK—A. E. Clarke, 114 Acacia Ave., Greenacre.
VK2BKT—J. R. Foldi, 15 The Outlook, Avalon.
VK2BSK—M. S. Kirby, 8 Cherry St., Turramurra.
VK2ZBD—J. Boyd, 29 Morgan St., Islington, Newcastle.
VK2ZCY—W. E. Bray, 4 Elizabeth St., Carlton.
VK2ZEY—A. A. Campbell, 179 Wardell Rd., Dulwich Hill.
VK2ZLG—B. R. Leslie, 13 Reuss St., Leichhardt.
VK2ZRJ—R. J. Alford, 154 Moulder St., Orange.
VK2ZSF—W. H. W. Shand, Unit 20, 704 Victoria Rd., Ryde.
VK3AJX—G. J. Marcon, 26 Darling St., Moonee Ponds.
VK3AWI—W.I.A., Victorian Division, Station: 9 Bayview Rd., Frankston; Postal: P.O. Box 36, East Melbourne.
VK3AXL—J. A. Ferguson, 594 Plenty Rd., Preston East.
VK3AZL—P. J. Gibson, 5 Florence Court, Dandenong.
VK3ZFR—Christian Brothers, Edmund Rice College Radio Club, Plenty Rd., Bundoora.
VK3ZFU—R. J. Padula, 404 Mont Albert Rd., Mont Albert.
VK3ZFY—R. G. Russ, 30 Clarks Rd., East Keilor.
VK3ZGU—J. F. Sutcliffe, 115 Magnolia Ave., Mildura.
VK3ZQA—M. L. Brane, 24 Ernest St., Broadmeadows.
VK4AD—A. D'Arcey, 20 Kitson St., Morningside.
VK4DX—Dutton Park Scout Radio Club, Station: Scout Den, Cameron Park, Fairfield; Postal: C/o. P. Wilkins, 90 Brisbane Corso, Fairfield.
VK4JQ—J. W. Morris, Fellnaw Private Hotel, 594 Ipswich Rd., Annerley.
VK4NH—N. S. Hill, Prince Henry Drive, Toowoomba.
VK4TB—T. H. Barber, Carowell St., Acacia Ridge.
VK4XC—J. R. Morgan, Station: 2 McKewen St., Bundaberg; Postal: P.O. Box 18, Bundaberg.
VK4ZDK—D. Kraatz, 166 Kerrigan St., North Rockhampton.
VK4ZRN—R. L. Neilson, 17 Shaw St., Bardon.
VK5IZ—I. K. Carmichael, Yorketown.
VK5ZCN—C. Neaylon, 14 Manse Tce., St. Mary's.
VK5ZLP—L. N. Porter, John Dallwitz Ave., Angaston.
VK6HP—H. R. Pride, 26 Lockhart St., Como.
VK6PY—P. Yates, 12 Robins Rd., Kalamunda.
VK6RI—R. D. Cobby, 89 Halvorson Rd., Morley.
VK6ZBF—R. B. Burge, 150 Boulder Rd., Kalgoorlie.
VK6ZCC—M. L. O'Rourke, Broadcast Station 6CI, Collie.
VK6ZFM—M. L. Faulkner, 37 Nanson St., Wembley.
VK7DG—D. R. Gothard, James Ave., Kingston Beach.
VK8ZBB—A. H. B. Brodrick, Station: 51 Nightcliff Rd., Nightcliff, Darwin, N.T.; Postal: P.O. Box 576, Darwin, N.T.

☆

R.D. CONTEST RESULTS

(Continued from Page 15)

New South Wales

WIA-L2033	D. W. Shephard	420	points
L2258	C. S. Shaw	394	,,
	F. B. Kupljenik	311	,,
L2259	P. Vernon	304	,,
L2211	C. Aberneathy	138	,,
L2283	R. Mackintosh	116	,,
	B. Mitchell (Y.M.C.A. Youth Radio Club.)	116	,,
L3074/VK2	J. M. Hillard	76	,,

Victoria

WIA-L3138	G. N. Earl	832	points
L3125	D. James	723	,,
L3188	C. R. Christiansen	533	,,
L3185	B. J. Hannan	426	,,
L3183	P. W. Duddy	369	,,
L3101	N. G. Harrison	352	,,
L3190	G. Orr	312	,,
L3042	E. W. Trebilcock	297	,,
	D. H. Jenkin	213	,,
	N. D. Mifsud	173	,,
	R. Lemke	120	,,
L3203	G. Wallis	103	,,

Queensland

	W. Thorpe	662	points
WIA-L4071	R. Tedaldi	309	,,
	K. D. Cunningham	209	,,
L4010	G. V. Franks	169	,,
L4053	L. O. Tully	156	,,
	L. Davies	119	,,
L4015	R. W. Howe	112	,,
L4018	C. H. Thorpe	95	,,
	H. G. Clinton	55	,,
L4011	G. Milner	51	,,

South Australia

WIA-L5065	A. F. Raftery	821	points
L5015	W. J. Clayton	713	,,
L5020	F. W. Aslin	452	,,
L5069	B. F. Brockhouse	445	,,
	D. Clegg	350	,,
	G. W. Douglas	338	,,
L5067	T. C. Corbin	290	,,
	R. G. Edmeades	252	,,
	K. Rendell	212	,,
L5070	D. Beale	208	,,
	N. I. Smith	187	,,
L5066	C. R. Welke	104	,,

Western Australia

WIA-L6021	P. W. Drew	1,115	points

Tasmania

	G. C. Johnston	908	points
	L. Pretty	716	,,
	G. Power	456	,,
WIA-L7033	B. M. Muir	313	,,
L7031	R. J. Mutton	308	,,
L7022	R. L. Hurwood	127	,,
	P. Chalk	81	,,

Disqualified Log VK7ZAH

V H F

52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

The month of March saw the launching of the long-awaited OSCAR III. Unfortunately it was not as effective as hoped and though many tried we have no positive proof of a two-way contact being made via Oscar. The grapevine suggests that OSCAR IV may be launched later in the year and the lessons learnt by OSCAR III will be used to some advantage then.

The month of March saw the introduction of Channel 0 in Brisbane and no doubt will see the struggle for survival of keen 6 m. operators in the Brisbane area. So far only occasional traces of the sound has been heard in Melbourne by those listening for it. We trust that the introduction of Channel 0 in VK4 will not thin the ranks of the 6 m. operators as it has done in Melbourne. While low power and net frequency operation has helped considerably in Melbourne, it has not entirely eliminated T.V.I. I.T.V. is another source of trouble. With such a colossal signal just outside the band cross modulation and other problems keep a lot off during T.V. hours—others appear to be completely overcome by the threat. Quite a few T.V. receivers cannot discriminate the amateur from the T.V. signal which makes it well nigh impossible to exist alongside T.V. The only time one operates with complete immunity is when the T.V. is off the air. Any increase in T.V. hours appears to see a further decrease in amateur activity on 6 m. No one appears to be able to solve the problem—can anyone come up with a worthwhile solution to keep operation on 6 alive and live with T.V.

Apologies for the non-appearance of the VK4 notes last month. In the rush to get the notes in after the W.I.C.E.N. business the VK4 notes were overlooked. Sorry. Peter, 3ZGP.

NEW SOUTH WALES

At the April meeting of the Group held at Wireless Institute Centre on the 2nd of April was the annual meeting of the Group. Following the lecture given by Les VK2ZBJ, which dealt with many aspects of the recent Oscar III project, the elections were held. Ten members offered themselves for the election and the winning six were: Pres., Paul VK2ZPJ; Vice-Pres., Tim VK2ZTM; Secretary, Mal VK2ZML, and Committee, David VK2ZVW, Phil VK2ZPI and Stephen VK2ZSK.

Past President Mac VK2ZH delivered his report which outlined the many achievements of the Group in its activities over the past year. David VK2ZVW received his cup for winning the Chairman's Trophy for events for the year.

On the 5th April Sydney's 4th T.V. station, Channel 10, took the air. While putting out a good signal it has added new problems to the 2 metre operator. The difference in frequency between Channel 2 and Channel 10 is 145 Mc. Many receivers have spots on and about 145 Mc. Channel 2 plus a 2 metre signal produces a slight herringbone pattern on Channel 10. No doubt these problems will soon be overcome by the local operators.

The first 6 metre fox hunt held for a long time in Sydney was a change for the many 2 metre hounds when it was held in March. By the time the fox called a halt the field had been spread over 20 miles, from the coast at Botany Bay to past Parramatta. A good evening, no doubt the start of many more.

The first Channel in this State is due to start at the end of April as the National station—ABMN—for the Wagga area. Located on Mt. Ulandra.

The Convention Week-end was very successful, even it it were the second hottest March week-end on record. Apart from the regular 6 and 2 metre fox hunts future events will include a contest in June to warm the operator up again for the R.D. Contest. While I believe it is an agenda item for the Easter F.E. Convention the contest committee is again ready to run our own version of the R.D. contest if it is not included. We suggest that other States might do likewise.

Activity in general is again quiet, just the regulars on 6, 2 and above. Well, I hope I make the deadline this month. 73, Tim 2ZTM.

VICTORIA

Other than some attempts at working Oscar III, the V.H.F. bands have been relatively inactive over the past month.

6 Metres. This band shows some activity, mainly at week-ends, most of this being on the 53.032 Mc. A.M. net. In some parts of Melbourne a G.D.O. running on 53 Mc. in an unshielded shack can cause T.V.I. on Channel 0 up to ¼ mile away, on a 20 w. transmitter completely obliterates the picture and plays havoc with the sound. A 20 w. F.M. transmitter on 52.525 does not affect the picture as much as an A.M. transmitter but virtually takes over the sound to the extent that receivers of Channel 0 can identify the voices of operators using the equipment. Most of this can be cured by fitting traps to the T.V. set, but can anyone suggest a cheaper way of keeping out of Channel 0 with traps costing about 4/- each, which is expensive when up to 20 T.V. sets have to be trapped. The traps in use in Melbourne which have proved effective are 2 ft. of 300 ohm ribbon shortened at one end and fitted with a 3-30 or 5-50 pF trimmer at the other. The traps are taped to the T.V. feeder close to the antenna terminal on the T.V. set. The trimmers are adjusted for minimum interference at your operation frequency. The width of the traps is about plus or minus 200 Kc.

2 Metres. Activity on this band is poor but was very active during the period 5th March until the 11th March, when some 100 Amateurs set up communication in the bush fire areas of Gippsland. Most activity was on F.M. Channel A 145.854 and Channel B 146 Mc. A little use was made of 6 metre for link purposes.

OSCAR III. Many Melbourne and VK3 country stations have been monitoring Oscar III but no confirmed reports of two-way contacts have been received from VK at the time of writing. Oscar III is still orbiting and sending out telemetry signals but the translator has ceased to function.

The only other activity on 2 metres is the 2 metre scramble when some 20-30 stations appear for a one-night stand in the half-hour battle to be control station for the next scramble.

2 metre fox hunts, which are held on the 4th Wednesday of the month are still popular with about four hounds showing up on the average —we would like to see more hounds in the future.

432 Mc. From reports received there is only one active station on this band and he is busy trying out transistor conversion with low noise figures. His best yet is 4 db. of noise. More from this station in future "A.R's."

The VK3 Div. V.H.F. Group is now an associated group within the VK3 W.I.A. Division. Its management committee is as follows: President, Cyril Edmonds VK3AEE; Vice-President, Jack Taylor VK3ZJF; Secretary, Len Poynter VK3ZGP; Treasurer, Peter Cohn VK3ZPC; Publicity Officer, Cyril Maude VK3ZCK; QSL Manager, Bill Rice VK3ABP; Equipment, Jim Force VK3ZJF, Ken Jewell VK3ZNJ.

The last two are assisted by a large team of volunteers who have to be dragged from their one-eyed monster with a tow truck. This shows they are keen (on what?).

Channel 0 Brisbane. The sound and picture have been received in Melbourne a few times over the past couple of weeks but not at T.V.I. strength, but have been told that it has caused T.V.I. in some country areas. I wonder if there will be any T.V.I. from TVQO next summer? I hope so, so do many others. Well cheers. 73, Cyril VK3ZCK.

QUEENSLAND

The month of March here in VK4 began with a bang and certainly has ended with a bang! Early in the month, Tuesday the 9th to be exact, no less than 22 stations were working during evening on 6 metres. Those known to have been around that evening were: 4MW, 4HW, 4ZLG, 4ZAV, 4ZKP, 4ZNK, 4AC, 4AB, 4ZEP, 4ZAL, 4VX, 4ZRM, 4ZDF, 4ZJR, 4ZLL, 4ZRC, 4ZBD, 4ZGN, 4ZLT, 4ZAT, 9ZBV, 4UL and myself.

John 4AC and Ramsey 4AB came to town from the South Coast and John was able to establish that his mobile did in fact work very well. Ramsey was his usual self talking about "the station that is live in '65."

During the middle of the month Oscar III went into orbit and the instant information service from John 4RZ was very impressive. John is to be congratulated for his fine efforts in feeding up-to-date information on Oscar predictions to those who needed them. Many stations here in VK4 did hear the low side beacon but to date that is all that I know of that has been heard. There has been some disappointment that no signals were heard from the translator and some have said that the signal from the beacon was weaker than those from previous Oscars. Nevertheless it was certainly a worthy project and perhaps if there is an Oscar IV we here in VK4 will have more success.

March 22nd was the big day for the VK4 doughnut factory to open. Its signals across the 6 metre band are very impressive and Victor 4ZBT tells me he can hear all 27 transmitters at Channel 0! Activity has slowed somewhat but has not died at all. Many contacts are being made from mobiles in the mornings. Some stations have been working on the low end of the band while the station has been transmitting. There are lots of ideas going around at the moment as how best to overcome the problem. Let's hope that some of these ideas bear fruit.

Within the first few days of TVQ coming on the air reception reports were received from Townsville and from both Mildura and Donald. If this type of propagation is occurring at this time of year why haven't we heard any 6 metre DX? Surely Channel 0's groundwave does not extend a thousand miles! Incidentally, the reference to 25 Kw. towards Melbourne in the March "A.R" was, of course, of humorous value only. In actual fact only about 700 watts is going in the direction of Melbourne and vice versa.

One Saturday I did work 4ZEL and 4ZDJ, using a 48 element phased array, 650 feet above ground level. The TX only cost a tenner but my—was the antenna expensive!

Finally, some short, disjointed bits and pieces of news. Frank 4ZAS, who has been very silent lately, is believed to be learning dits and dahs. Reg 4VX is wondering what next to try to load into. Best signal yet comes from his 40 metre long wire! What is going up in 4ZAA's yard? In closing, remember "Dial 'Oh' for nought." 73, Peter 4ZPL.

SOUTH AUSTRALIA

Activity within VK5 at the moment is most feverish, with the main front of activity directed at the Oscar III satellite.

Unfortunately, to date no VK5 station has worked via the translating satellite, which is most disappointing when related to the king size beacon and telemetry signals recorded by various partakers within VK5. Many rumours regarding contacts overseas are circulating, whereas official confirmation of these reports will take time to eventuate.

Stations who have been actively engaged in tracking and recording the passes of Oscar III have been VK5EF, 5WV, 5ZDX, 5ZBR, 5ZKA, 5ZKY, 5ZMJ, 5ZTM, 5ZHJ and 5ZDR.

VK5 attention to Oscar III has been most invigorating and it appears that if and when Oscar IV is launched a more sophisticated approach to the problems associated will be attempted by a larger number of Amateurs than presently engaged in Oscar III experimentation.

Apart from active 2 metre activity, the other VHF bands have been temporarily neglected, but will no doubt resume to normal when Oscar III has met its "fiery end."

The art of "SSB-manship" is being tackled by the VK5 VHF group as a group project, and should enable a few SSB stations to be "quacking" interstate during the next 6 metre DX season. Colin VK5ZHJ.

WESTERN AUSTRALIA

Oscar III was first heard in our State by 6ZAZ. 6ZCN, 6HK, 6ZAA, 6ZCB and 6BO who have been listening constantly. Many feet of tape recording has been made. No DX contacts, however, as the translator had a malfunction after the first few orbits.

6VV and 6ZCN were in Perth recently. Brian is moving to Quairading soon. 6ZFM is moving to Bridgetown and may not be heard in Perth. 6ZDS is off to Carnarvon for a holiday and hopes to see the tracking station. 6MM is looking for some 4-250 A's for a 600 w. pep 52 Mc. rig. All donations welcome. 6ZCM has not been heard for some time. What's brewing in your shack, Viv? 6HK

(Continued on Page 22)

S W L

Sub-Editor: Chas. Aberneathy, WIA-L2211
30 Urunga Parade, Miranda, N.S.W.

I am sorry to have to start our page in the following manner, but feel justified in so doing, as letters such as I quote will let our members see just what is going on, and by reading these excerpts will realise why their cards are not confirmed.

The following is an extract from a letter received from Jock White ZL2GX, awards manager for the N.Z.A.R.T., which contains a message that all SWL's should read and thoroughly digest. I quote: "I have just filled in two ZL4JF QSL's for VK listeners, and on each I have written, 'your report was valueless,' a bare report and much guff about their length of listening experience, but no comparisons with other signals or comment on conditions. I have a bundle of cards from VK3AEF, a Boy Scout Club, for a bunch of ZL's. All are quite valueless, and I have a mind to send them over to you as an example of what is happening.

"Much worse happens in Europe, without fail when European QSO's with ZL4JF or ZL1ABZ are reported in DX Bulletins, I get a flood of SWL reports, coincidence is too obvious to completely overlook. For years I have championed SWL's, coached, coaxed and encouraged, but the worm is turning. The situation is, I feel, quite serious, as valueless reports, and bogus reports, will hurt the genuine fellow."

Recently I forwarded a QSL card for a JA SWL to VK5KO, who replied in the following manner, I quote, "I do not believe that your JA friend did in fact hear me as reported. Several first-class JA stations did hear me on this night on 1.8 Mc., and each reported on the abnormal nature of my calls. The fact that I was heard on the night in question was reported in the Jap. radio and straight press during December. A JA SWL sent an air mail report within a week, but it was obvious to even an apprentice at this game that he had heard JA3JM, and JA3AA calling me on 1880. My frequency had been published at 1832 Kc., and this was named. Actually, I was not within co-ee of 1832 Kc."

Members have been instructed from time to time on QSLing, it is so easy to send a good, honest report containing something of value to the chap at the other end. The above extracts may be the reason why so many SWL's complain of no returns.

AUTOMATIC VOLUME CONTROL (AVC)

In a modern radio receiver a gain or volume control is provided in the output of the detector to permit varying the volume of the incoming signal. Once the volume control has been set, the output of the receiver should remain constant regardless of variations in signal strength, fading, etc. These signal variations can overload the RF, IF, or detecror stages and lead to distortion in the signal in addition to volume variations. The Automatic Volume Control (AVC) circuit overcomes these deficiencies and maintains approximately constant loud-speaker volume.

Automatic volume control can be achieved by very simple means. The RF and IF stages of a superheterodyne receiver utilise variable-mu pentodes, whose gain can be controlled by varying the grid bias. If we make the grid bias of these RF and IF stages more negative when the signal strength increases, thus cutting down the gain and less negative when the signal strength is fading, we will attain more or less constant output volume, regardless of signal strength. All that is needed, therefore, is a negative voltage bias whose value is controlled by the signal strength. The load resistor of a diode detector is an excellent source of this variable voltage, since the rectified signal voltage will increase and decrease with variations in signal strength.

The AVC diode is usually combined with the regular diode detector in the envelope of a single duo-diode, and sometimes the first audio amplifier is thrown in also by using a duo-diode-triode tube. Since some AVC bias is developed even for weak input signals where maximum amplification is desired, a special delayed AVC circuit is occasionally used, which prevents the application of the AVC bias until the signal strength exceeds a predetermined value. This necessitates another diode.

I would like members' reaction to the idea of making our page in the December issue of A.R. an article from each State effort. You may think that it is a bit early for such a thought, but it will give those who wish to co-operate plenty of time to write a short article on some aspect of our hobby.

NEW SOUTH WALES

At the annual general meeting held in March the following members were elected to office for the ensuing year: President, Ross Erwin; Vice-President, Brian Hutchinson; Secretary and Treasurer, Tom Harding; Liaison Officer, Allan Chatto; Publicity and QSL, Chas. Aberneathy. We extend thanks to the committee of the past twelve months for a job well done, also a welcome to the new group, and trust that they can continue with the standard set by those of last year.

Ray L2287. Congratulations on passing your second class morse, and regulations, and I hope that you can do the same with the theory and marine practical. It sure is hard to reach that 100 confirmed.

Jerry L2229 is down in the Wagga area, and reports hearing KP6, KS6, KJ6, KW6, KH6, KX6, KG6, JA2, HM2, DL6 and LA7. I trust by now that you have an aerial to suit your roving job.

Colin L2188 is now the proud owner of an HCR C2 rx. I trust that it will give you many hours of good listening. Very good on your points in the NFD Contest also on your 2 metre activity.

Bruce L2283. Those chaps who have 200 countries have been listening for quite a considerable time, so keep at it OM, and one of these days you could reach that tally.

Arnold L2291 recorded on tape the launching of Gemini project as broadcast by VOA. All the best with your AOPC course. I guess that you welcome the cooler weather out in that area.

Doug L2047. Nice to hear from you OM. Thanks for those cards which I will certainly pass on to our members, and use their QTH's for the card swappers.

VICTORIA

The monthly meetings now have an average attendance of 40 members, and you have to be early to get a chair. Attendance at the radio constructional nights is also at a high level. The Victorian S.W.L. convention will be held towards the end of the year, and all members will be informed as more information becomes available. The group now has an official constitution stating the aims and operation of the group. Ian L3006.

Roger L3158. I trust that your lecture on your home-brew rx was a success. How about sending me a description for publication as I feel that our members would appreciate such an article?

Warwick L3211. You are certainly creeping up the ladder, but with plenty of study ahead it will curtail your S.W.L. activities. Latest cards to hand, XS7, KG6, VE1, LA5, OE1, 5M5, GD3, F9, MP4 and K2/JY.

Lloyd L3141. That tower project sounds very interesting, especially the rotating mechanism. O.K. on the QSL cards, you will be able to catch up on your reports now Hi. Don't forget that study O.M.

Greg. L3138. Thanks for the copies of the Club call signs, also for the W SWL cards, as I can certainly use their QTH for card swappers. Cards received SP9, KB6 and W9, whilst 40 cards have been sent this year. Very good on the 21 Mc. opening. Mac sends his regards.

Harry L3102. You must have quite a variety and varied stack of radio matter. I think time was well spent in filing same for reference. Thanks for your offer, which I may call upon in the near future.

Maurie L3055. Thanks for your letter Y.M., always pleased to hear of your doings, radio or otherwise. Maybe when your studies end you will come back to the page in earnest. Sorry re the antenna booklet, but will look forward to that article for our page.

Eric L3042. Another one on holidays, I don't know how you do it down there as we only get them once a year Hi. As usual, too much to print, but a few of the cards received were: HP1, UL7, VR2, VS6, VU2, 9M2 and W3/MM. Heard 3.5 C.w., KH6, W3, W6, W8. 7 Mc., BY9, HM1, EP2, F8, UA3, UB5, VE2, LZ2, YO9, YU5. 14 Mc., C.w., FK8, JT1, HM1, UL7, VS6, ZP7, 9M4, 9M6 and SM7/MM. I hope that you both had a nice trip to VK5.

QUEENSLAND

Conditions are greatly improving on 20 metres with excellent openings to W over the long path on Sunday afternoons. At night I have had mediocre openings to Europe over the long path 1700 to 2100 hours E.S.T., after which there is a no man's land till around 0002 hours, when the VS9 Maldive areas come in, and 9NI and an odd African State such as 9U5. Over the long path the DL's are the most consistent.

Afton L2136/VK4. At long last a letter. Well it was a pleasant surprise. Congratulations on reaching 100 confirmed. Yes, it is sure a struggle to reach that mark. I will be pleased to give you back a rung on the ladder. I do hope that your health keeps improving.

SOUTH AUSTRALIA

Allan L5065 has heard on 14 Mc. C.w. UR2, HA7 and OK3. QSL's received MP4BCC. No doubt you had an enjoyable time in the shack of VK5RD, and I hope that all those confirmations come your way.

Tim L5067. Sorry to hear about the tower situation, still you never know, Hi. Thanks for that award piece as one of these days I shall get around to that article. Heard recently, VU2, CE2, VS9, MP4 and KS6, and QSL'S from I1, K6 and VK3.

Kuno L5072. Welcome to the page O.M., and I hope that you can send me something each month. Kuno uses an AR88 rx with a Geloso preamp, while his antenna is a folded dipole on 20 metres. Maybe when you get your own cards your returns may be better. Keep SWLing and forget about that knitting Hi.

WESTERN AUSTRALIA

Bryan L6068. That idea of getting a club started in your area is certainly a good one, and I do wish you every success. If at any time I can be of assistance just pen your request. Recently heard on 20 metres, KS6, W0, SM7, AP2, LU7. 15 metres, W1, W6, ZS8 and SM5. Pleased to hear that your beam for 52 Mc. was to your satisfaction.

Alan 6030. I do hope that you are on the mend and will soon be out of hospital as I have missed your letters. So hurry up and get back to those dials.

Geoff L6029 reports that the W's are coming in well on 20 metres, and thinks that the bands in general are opening at his location. Heard on 20 metres, HK1, W4, K5, CR8, KZ5, WB6 and WA4, whilst on 15 metres, LA1, W2, ZS2 and KR6.

Peter L6021. It appears by your letter that you have been relaxing a little SWLwise. I think most of us get that way from time to time. Those QSL's from OA4, 7GI, 5N2, K7/3W8 and W9/XU were a very welcome bunch I guess. I doubt if many of our members have 90 SW BC confirmations to their credit, which is a very good effort O.M.

TASMANIA

Greg Johnson reports that during February he managed some 35 countries, and that 20 metres seems to be going downhill slowly, and like 15 is getting very noisy. Thanks for your offer of assistance, which I will mention later in this page.

GENERAL

If any SWL in Tasmania has a problem, Greg Johnson, 3 Inglis Street, Newtown, Hobart, Phone No. 82416, will be only too pleased to assist in any aspect of our hobby.

For the card swappers a few more addresses: KDD-4121, R. Murray, Route 2-28040, Ellenboro, N.C., U.S.A.; WPE3EGI, Ed. Barkowski, 1911 Freeport Road, Arnald, Pennsylvania; KHJ8203, R. Hittle, P.O. Box 523, Defiance, Ohio, 43512, U.S.A.; ZL190 Dave Thomson, 8 Wallace St., Whangaui, Northland, N.2, New Zealand, and his son, ZL149 Barry, Freyberg Rd., Ruawui, Northland, would welcome VK SWL's to drop them a line on their doings.

Kuno Hoehle L5072, c/o Junior Staff Club, Woomera, S.A., is seeking advice or a publication concerning modifications to his AR88. Also re a mechanical filter for same.

Well, that is it once again. So until next month, cheers, and remember, "DON'T go home early by ACCIDENT." Chas. L2211.

S.W.L. DX LADDER

	Countries Conf.	Countries Hrd.	Zones Conf.	W States
E. Trebilcock	285	293	40	50
P. Drew	160	258	35	34
A. Westcott	100	159	34	11
M. Hilliard	91	241	33	14
M. Cox	89	225	33	23
G. Earl	85	163	33	14
R. Kearney	79	147	32	—
L. James	76	174	30	14
W. Smith	67	177	28	7
N. Harrison	63	177	32	38
A. Raftery	31	148	20	9
R. Harrison	20	70	17	5
B. Prosser	17	136	8	2
B. Mackintosh ..	15	58	15	3

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

CONTESTS

Editor, "A.R.," Dear Sir,—I was interested to read in March "A.R:" of the experiences of your correspondent L. H. Vale, VK5NO, in trying to reach the Contest Committee through the "correct channels."

I, too, in years gone by had similar troubles, and finally, assuming that I was probably the only Ham in Australia who wanted a change in contest rules, I lost my missionary zeal and retired from the field. VK5NO's letter has provided the necessary spark to fire up my enthusiasm again.

My interest is c.w. only, but my suggested rules can be used for all modes—they are based on the A.R.R.L. sweepstakes and the B.E.R.U. rules. With a view to their eventual adoption as R.D. rules, I suggested that we might try them out on a couple of single-band contests such as 80 metre, 80 metre low power (5 w. max.) or 160 metre, held on a Saturday night from, say, 2000 to 0200 E.S.T. (to put VK6 on an equal footing). With only a 4 to 6 hour duration, we should get enough starters to keep everyone busy, to show up the smartest operators and to still leave some stations unworked because they couldn't be contacted in the time available. Maybe we won't get 500 entrants like in the R.D., but even 100 should make for an interesting few hours of activity.

Basically the rules are:—

(a) Contacts, instead of being interstate only, to be between all Amateurs in the Commonwealth and Territories irrespective of location.

(b) Areas, Federal Electoral Divisions and named Territorial areas. There are 128 Divisions (including Northern Territory and A.C.T.) and Territories, Papua, New Guinea, Norfolk, Cocos, Nauru, Christmas and Antarctica.

(c) Emissions, c.w. v. c.w., Phone v. Phone. **not** an open section.

No logs would be submitted to the Contest Committee, only the claimed number of contacts, areas contacted and total score. The Committee would then just collate the information received into a form for publication in "A.R." No certificates, no prizes.

If the experience of these "QSO Parties" shows that the rules are satisfactory, maybe they could later be incorporated in the rules for the R.D. What about giving this idea a go in an 80 metre c.w. contest this winter?

I consider that this scheme of "everyone working everyone" would solve the problem of team contests. Just add the scores of the first 6 or 10 leading stations in a State, and you have a team score—no need to apply factors derived from some obscure algebraic function of active and inactive Hams. The more in the contest the better will be the scores all round.

—John Tutton, VK3ZC.

P.S.—The detailed rules are ready and waiting for publication in "A.R" ! ! !

SEMI-CONDUCTORS

Editor, "A.R.," Dear Sir,—It is gratifying to observe that capacitative transient suppression is being given more attention in power supply designs employing semi-conductor rectifier diodes, particularly for articles appearing in "Amature Radio." There is, however, still a tendency to use OA210 (or equivalent) for all purposes, even though diodes of lower voltage rating are available. For example in the article "Semi-conductor Power Supply for Transcelvers," in the February, 1965, issue of "A.R.", Mr. Collett uses an OA210 to rectify 12 v. (r.m.s) in a half wave configuration. The peak voltage from the secondary would be 17 v., and the peak reverse voltage across the diode would be about 34 v. Allowing 50 p.c. safety factor for overvoltages, a 50 v. diode would suffice, such as the OA605, or equivalent. This could be a valid consideration for a constructor who does not necessarily have a junk box full of the 400 v. diodes.

I might mention, however, that the 50 p.c. safety factor would only apply if the circuit were adequately suppressed for transient overvoltages. This could easily be accomplished by placing a 0.01μF. condenser across the primary of the power transformer.

—R. L. Gunther.

THE BALL IS IN YOUR COURT

Editor, "A.R.," Dear Sir,—The article in the March edition under the heading "Are you in the groove?" was certainly thought provoking.

However, due probably to Lindsay Douglas' good breeding (or manners) he did not lay it on the line, he pulled his punches in fact. I won't. Try this on for size . . .

Australian Amateur Radio is slowly sliding into an ooze of apathy and negative thinking seldom, if ever, seen before.

While overseas Amateurs are supported by their Governments, and still enjoy full operating privileges and frequency limits, Aussies lose a large hunk of 80 and half of 40 and say nothing. The 7 Mc. band is now so full of commercials and others that it is becoming virtually useless. The 3.5 Mc. band is rapidly following suit. Our last hope, the 14 Mc. band, is already prostituted with several regular commercial users. Still we do nothing. There's your apathy — now for the negative thinking.

Let's look at the opening lines in Lindsay's article. "Australian stations using s.s.b. equipment at 30th June, 1959 (were), 50." This is in itself an indictment of Australian Amateur Radio, when we consider that foreign Amateurs had been using suppressed carrier techniques for TEN YEARS at that stage. While hundreds of U.S. Amateurs were enjoying the immense benefits of this great new mode, backward "die-hards" in VK land were still extolling the virtues of a system ALREADY ten years out of date, and making sick jokes about that "duck talk." This was six years ago.

Now look at the last line of Lindsay's table. Certainly it is encouraging to see the great progress that sideband has made—but it is sickening to see that some 90% of the nation's Amateur operators still favour a system that went out with button-up boots.

We should be proud of the fact that suppressed carried systems were perfected by Hams, and their first wide use has been by Amateurs. S.s.b. is here to stay, the benefits are well known, and simple construction details have been published in most Amateur Radio journals since those first startling articles appeared in "CQ" and "QST" magazines in 1948.

Nearly twenty years later there is no earthly reason why anyone should persist in radiating a carrier in our already crowded bands, THUS CAUSING NEEDLESS INTERFERENCE TO OTHER USERS.

What then is the remedy? First find your cause. The only two I can think of are (1) "This sideband rig will cost me real money"; (2) "I don't think I can build one anyway." I refuse to concede that ANY Aussie Ham lacks enthusiasm or a progressive outlook.

As far as item one is concerned, the cost of getting started need not be very much at all. First practise receiving sideband stations with your present receiver, practise until you can resolve sideband signals instantly and instinctively. If your oscillator drifts, fix it. In the meantime use your b.f.o. pitch control for fine adjustment. Add a product detector if necessary. Answer s.s.b. stations, tell them you're thinking of "going sideband." You will be delighted at the response—fire away with your queries.

Next take stock of your a.m. rig. Is your v.f.o. stable? If not, make it stable, then send the undersigned a circuit or block diagram of your transmitter with a stamped-addresed envelope.

I will send you back another showing you how to convert your present transmitter to sideband using as few new parts as possible. My first sideband rig in 1957 cost about a tenner, yours could cost less. It costs only 5d. to find out.

This also answers problem number two. Of course you can get it going—and soon. Now what about it you a.m. chaps? The ball is in your court. Are you in the groove?

—Steve Grimsley, VK1VK, etc.

[Have a quack boys—it costs fivepence.—Ed.]

NATIONAL FIELD DAY

Editor, "A.R.," Dear Sir,—We would like to comment on this year's National Field Day Contest. Although we did not enter the contest as a club team, there were two teams of club members in the contest and these teams have made observations that we would like to bring to the attention of all concerned.

The first point was the number of contacts made where the operator was unaware that there was a contest in progress. We would, therefore, like to see much more publicity given to this event by "Amateur Radio" and other radio journals. To this end we intend to publicise the event much more through our own journal "Info" and hope that other clubs will do the same.

The second observation was that the number of stations in the field was very small. In this regard we would appeal for many more operators to enter as a portable station in future contests.

In closing we would like to thank all competitors for their contacts with our two teams, VK5TM/P and VK5VE/P, during the contest.

—W. A. Thomas, Secretary, E.A.R.C.

☆

Publications Committee Reports That . . .

Correspondence was received from the following, which includes all inwards mail up to the 12th April: VK's 1VK, 4VX, 2AXS, 2HA, and Messrs.: R. L. Gunther, H. M. Schroeder, D. Buck, N. Burton, together with technical articles from: 3KG, 3ZCK, and P. Ward in addition to letters from SWL L4018 and L5067.

As explained in the March issue of "A.R" no committee meeting took place that month, hence various matters were held over until this meeting and your committee regrets that this delay occurred.

The question of matters likely to arise at the Federal Convention regarding "A.R." were discussed and our report was tabled for all members' agreement. In addition, the question of future advertising rates was raised and it was agreed to proceed with an advertising campaign to increase our income. This matter will be more fully discussed at the next meeting.

The question of all Notes was raised and in view of the changes at our printers it was considered that, rather than put forward the deadline for receipt of Notes, it would be better to have a standard form for presenting all notes to the printer. Copies of these sheets will be forwarded direct to all contributors. It is emphasised that if contributors do not use the correct forms their notes may not appear in "A.R." This is a policy matter by the printer and this committee must comply with it. A more detailed explanation has been forwarded to each correspondent.

Many "A.R.'s" are being returned marked "UNKNOWN AT THIS ADDRESS." Readers are again reminded to notify their Divisional Secretary in advance of any change of address, and direct subscribers should notify the Victorian Division. Attention to this matter will help both the reader and your committee.

Due to some misunderstanding by all concerned, no Call Books were forwarded to VK6. Readers may obtain supplies from McGill's Newsagency, whose address appears in their current advertisement. No supplies are available from Victorian Division.

The Committee discussed the question of the changed arrangements regarding no booksellers being able to accept subscriptions to "QST," and decided that as Federal Executive had this matter in hand no action would be taken by the Publications Committee.

☆

VHF NOTES

(Continued from Page 19)

has built up a new 2 mx converter after dismal results on Oscar with the old one. 6VR lost a couple of mikes in his car recently. Warmth is good for old batteries Peter not microphones. If anybody wants to hire a tape or get one recorded with morse, the address is Mr. F. A. Pearson, 79 Birdwood Ave., Umina Beach, N.S.W. Perth Modern School has a YRS tx going on 6 mx, thanks to 6ZBY. The last fox hunt was publicised incorrectly due to an error in the minutes. However, one car turned up and found the fox 6ZAY in Lesmurdie. The fox was not audible on Greenmount as the beam was only 2 ft. high. People won't come on fox hunts any more if this happens again, so be more careful next time chaps. 6ZDW is up in Kalgoorlie. You will have to try for that morse test again Doug, as you ought to be on the 7 Mc. mobile up there. 73, 6ZAG.

FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL

I.A.R.C.

The International Amateur Radio Club in Geneva announces that to celebrate the Centenary of the I.T.U. there will be six I.A.R.C. stations with calls from 4U1ITU to 4U6ITU operating "round the clock" for 48 hours on the 16th to 17th May on the following frequencies:

1,810 and 1,830 Kc., 3,503 and 3,797 Kc., 7,003 and 7,045 Kc., 14,113 and 14,292 Kc., 21,050 and 21,400 Kc., 28,050 and 28,625 Kc. and 145.1 Mc.

Special commemorative operator certificates and QSL cards will be issued. All Amateurs interested should keep an ear out for any of these six stations.

OSCAR III

On March 9 OSCAR III was launched into a successful orbit around the earth. During the first two weeks of its life hundreds of satellite-repeated QSO's between Amateurs were achieved including trans-Atlantic contacts. The coherent beacon on 145.95 Mc. failed to operate but good telemetry was received from the 145.85 Mc. transmitter. The translator portion has been reported as inoperative since orbit 206 (1311 G.M.T. orbital crossing on 24th March). It is not expected that the translator portion will function again. The telemetry beacon (145.85 Mc.) continued to operate normally until orbit 244 on 27th March. It became intermittent after this orbit and was not heard by ground observers on orbits 248, 249 and 262. Signals re-appeared on orbit 263 and have been regularly received since that date.

It is requested that all interested Amateurs continue to monitor the 145.85 Mc. beacon channel following current orbital predictions and reporting reception and telemetry information to Project Oscar Headquarters. The March issue of QST (pages 16 to 18) clarifies the observation and interpretation techniques for the telemetry beacon. Equipment required for observations is the v.h.f. receiver, an oscilloscope and an audio oscillator. Project Oscar requests that all data, log reports and newspaper or magazine articles on OSCAR III be forwarded to: Project Oscar, Foothill College, Los Altos Hills, California, U.S.A. Please send all telemetry data (battery voltages and temperatures) airmail to the above QTH as it is urgently required during this critical phase of OSCAR III.

RADIO BEACONS IN RHODESIA

Early in 1964 a team of experimenters established a radio beacon transmitter operating on 50.046 Mc. at a prominent point near Mazoe in Rhodesia. This beacon has since been heard in Cyprus, Scotland, Germany, U.S.A. and many places in Africa and is still running continuously. A new beacon has since been set up at a more favourable site and operates 24 hours per day on a frequency of 1801.5 Kc. and sends "de ZE1AZD" with F1 modulation (FSK). The carrier is interrupted for 18 secs. every 7¼ mins. to allow no-signal conditions to be observed.

The transmitter, built by ZE2JV, has an input of 10 watts and is situated at the top of a range of hills 52 miles N.N.W. of Salisbury. The antenna is a centre-fed dipole, the upper quarter wave to a mast and the lower quarter wave from the beacon over the edge of a cliff. It is anticipated the beacon will be in operation for the entire period of the I.Q.S.Y. (International Year of the Quiet Sun) and reports of its reception, which will be acknowledged, should be sent to Ivan Wood, ZE3JJ, c/o E.S.C., P.O. Box 377, Salisbury, Rhodesia.

The team wished to thank the Southern Rhodesian Electricity Supply Commission at whose site the beacon is situated.

8th JAMBOREE-ON-THE-AIR

Mr. Noel Lynch, Commissioner and National Organiser of the Jamboree-on-the-Air, announces the 8th Jambore-on-the-Air for the week-end of 16/17th October, commencing at 10 a.m. on the Saturday. In addition to the usual Scout Groups that took part last year, it is possible that Girl Guides will also be taking part this next time. All Amateurs who participated last year are again asked to co-operate with the Scouting movement and to encourage other Amateurs to take part in this annual event. Your Federal President, Bill Mitchell, VK3UM, had the pleasure of meeting Noel during the 7th Jamboree at Rowville and of discussing matters of mutual interest. Further information, as it comes to hand, will be published in this column.

I.T.U. FUND

As at 10th April, contributions to the fund, as a percentage of the target set at the Sydney Convention in 1963, are as follows:

VK2	Nil	VK5	33%
VK3	50%	VK6	97%
VK4	50%	VK7	100%

These figures do not necessarily represent the amounts received by Divisions, but only as received by Federal Executive. Congratulations to VK7, the first to fill their quota. Please continue to send your contributions to your Division.

AMATEUR BAND SUB-DIVISIONS

Cw. Only	C.w.and Phone
3,500- 3,535 Kc.	3,535- 3,700 Kc.
7,000- 7,030 ,,	7,030- 7,150 ,,
14,000-14,100 ,,	14,100-14,350 ,,
21,000-21,150 ,,	21,150-21,450 ,,
28,000-28,200 ,,	28,200-29,700 ,,

— . . . —

NEW SOUTH WALES

HUNTER BRANCH

"But all the v.h.f. men were there." This is what I was told following the April meeting of the Branch held at the Tech. College. Due to a slight gastronomical indiscretion I was unable to be in attendance but it was my worthy off-sider and highly paid spy who told me about the activities. Des Mills VK2ZDN, that intrepid v.h.f. man, was the centre of attraction and he chose to describe in great detail his now famous two and six metre transceivers using transistors. Forty-four were present to hear all about the construction and, as you might expert, fully seven-eighths of them went away muttering, "I must have a go at one of those. They look pretty easy." Which one of us is going to count the heads of those who complete the task? Despite all this prophecy talk, a good time was had by all and many worthwhile clues gained in the "mag" session following the meeting. I hope that the current rumour of Des leaving the friendly domicile of the smoky city and sojourning in the far outpost of Kurri does not mean that we will lose his attendance at meetings. For my money, I'll back him against anyone in the soldering iron and tinsnips stakes. So please don't go away and leave us now Des!

One man who has left the Branch for greener T.V. screens is Bill 2ZCV, the Cessnock villain, although he really used this call sign to disguise the fact that Kurri was his home. Watch out you good Tamworth people and unsuspecting Televiewers, Bill is already there. Following long years of practice, aerial masts are old hat to Bill and, during a recent visit to the Cessnock club, he gave a demonstration of just how a mast should be raised. Some of the boys and my athletic self tried out this method later, out of sight of the crowd, of course. The result was absolute chaos! I won't say who finished up in the middle of all the guy ropes but he sat on one of the heavy steel aerial rods and bent it—the clumsy oaf! Sorry, Chris.

These chaps at Cessnock have either a small light or a big bushel because they certainly have been hiding it. On this same visit spoken of earlier, we all entered the old Town Hall in the black diamond city, because it was here, we are told, that the Radio Club might be found. But nobody could be seen! By careful listening, some sounds closely resembling morse could be heard "from afar" as Bill the Bard used to say. Following our ears, which is a quite difficult task, we came upon a scene which would have left the Mayor gasping, I'm sure. Seated in a very large throne-type chair was Chris (2PZ you know) while all his "councillors" sat around a huge (about 40 by 100) table listening to the rhythmical oscillations of the thousand cycles. The reason they gave, of course, was that it was the quietest room they could find. Putting all these witticisms aside, Chris, Nev (and even Sherwood) and all the others are doing a very worthwhile job both for Amateur radio and the Civil Defence signals section. After all this revelry Mrs. Chris invited us all to supper. Of course, I just had a small coffee and one biscuit but the others! Some had to be forcibly restrained such was the delicious array of good things spread before us. Helen and Mrs. Chris did all the hard preparation work, and made charming hostesses, ably assisted by Sherwood. (After this write up, I'm sure to be invited again.) Bones, of course, spoiled the whole night by driving home at a snail's pace.

Did you see that handsome face alongside a locomotive the other day? No it wasn't in the railway timetable. Our old friend Shannon (Bill 2ZL to those who don't know) hit the headlines on the magazine page. So great was the impact of all this that the Phenyle Bay railway is once again in business, and the profits are pouring in, as may be expected. Another well-known headliner of late was Harold 2AHA, who must have told the reporter lady a big fib about his activities on the air, because I've listened and listened and I can't hear him. It must be the skip. But remember all you who would chuckle about us celebrities getting our most handsome and flattering photographs in the paper—your turn will come. I am told that Mac 2ZMO ,our S.W.L., is in the running.

S.W.L. by the way means Sitting, Waiting and Listening. Whether or not he was S.W.L. for the television show which featured strawboard Oscar the other day we'll never know. But as it hapened many people were involved in this escapade. Max McLachlan made the model, Bill 2XT supplied the QSL cards for display, John 2ZJG kindly lent a genuine W6EE QSL and a good friend, Spencer Cotton, did the talking. All told it was a good bit of publicity for the Amateur Service. Bill 2XT did another remarkable thing during that week. It involved lashing out and re-equipping with a Drake transceiver for the car. I bought a Drake, too, but I ate mine at Easter—last year, or was it the one before.

A new character appeared on the local scene just recenly—one Two bob Maschetti alias VK6ZDM and hailing from Nollamara. Anyway Alyn, for that is his name, has agreed to speak about swindles in VK6 at the next branch meeting, which is at the usual place, Room 6, Clegg Building, at the Tech. on Friday, 7th May. We'll be starting at about 8 p.m., so I'll see you there. 73, 2AKX.

— . . . —

VICTORIA

WESTERN ZONE

Your scribe has very little to report owing to lack of activity during the past few weeks. All spare time being taken up with the paintbrush. Yes, even the shack, after everything had been removed.

John 3AFU and David 3ADS, two of our members, made the trip to Gippsland to help out with the fires. To you both we congratulate you on a job very well done.

with the colder weather coming on and 80 improving, we should have a good muster on our Wednesday night hook-ups once again. Pleased to hear Gordon 3NX back on the air after an absence of about two years.

Murray 3AMP is on the bands now and again and enjoys a QSO. Trev. 3ATR have not seen or heard for months, the last I heard of him he was on a cross country flight to VK4. My spies tell me he has a quad ready to be put up. What about those vee beams? It's time you came on and gave us the GG. Merv. 3AFO still comes on when

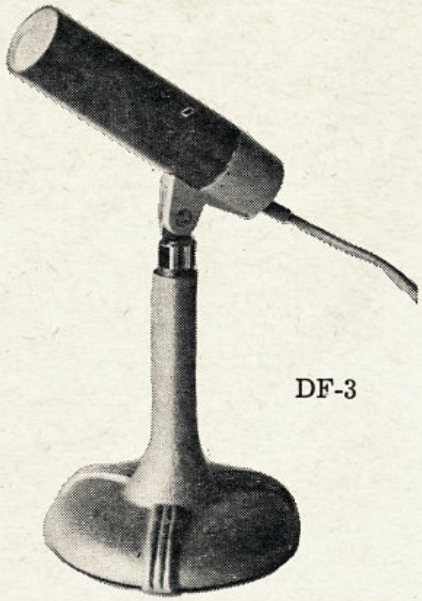
SILENT KEY

It is with deep regret that we record the passing of:—

VK3HG—N. Templeton.

VK4ST—S. H. Tumbridge.

FOSTER DYNAMIC MICROPHONES



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Frequency response .... 50 to 15,000 c.p.s.

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possible. Congratulations on the promotion but the sad part is we may be losing him before very long.

Bill 3AKW on long service leave, hope you enjoy it and catch up on that rebuilding you have spoken of for months.

Herb. 3NN, one of our committee members, still finds time to work the VHF bands with fair results.

Bob 3ARM, Neil 3AQD, Roy 3AOS come on now and again, the same goes for the VK5 boys, but on most nights conditions have been against them.

The rest of the members, some of you we have not heard for years, well, if you don't come on and let us know what you are doing how do you expect to see your name and call in print. We ask you to do the right thing. 73, Bert 3EF.

MOORABBIN AND DISTRICT RADIO CLUB

After the excitement of last month, members appear to be resting on their laurels. This was not so for our March general meeting, however, as a record number of members and visitors attended this gathering. All seats were occupied and the air was soon thick with smoke signals. General business was quickly dealt with and followed by an interesting talk by Ken 3ACS on the uses of a v.t.v.m. Whilst this talk was proceeding, a number of club members excused themselves to install gear at the Haileybury College at Brighton, for the purpose of an exhibit of Amateur Radio at its Fete, per the generosity of the Moorabbin and District Radio Club.

The Club exhibited various pieces of gear constructed by members and operated 3APC/P during the day. Harold 3AFQ's h.f. equipment was used for operations on 40 metres and Peter 3XK's 2 metre f.m. equipment. A very successful day resulted from the point of view of the Fete Committee, Amateur Radio interest, and the number of contacts. We were fortunate this year of not being plagued by interference from the model train exhibit. The previous year, h.f. conditions were marred by local, boy-made interference.

A natter night was again held at the clubroom during the latter part of the month. This enabled name tags of members to be brought up to date, and also operation of the Club station 3APC. The latter has not been operated in recent months due to a fault in the modulator. After our transmitting officer, Kevin 3ARD, was acquainted of this fact it was quickly rectified. We are not saying how, we may become embarrassed.

Activities during the month appeared to be fairly quiet, with construction again to the fore. Eddie 3EM is continually on the go with mods. and experimentation, and the latest, my spies tell me, is a beam for 2 metres f.m. Ken 3ZNJ has quietened down considerably, latest work assignment could be likened to that of a travelling man. Ken 3AFJ has been experimenting with a five-eighths whip for 2 metres f.m., and with very good success. A demonstration recently convinced me of its superior performances over a quarter wave whip. The only problem appears to be that garages are not built high enough to accommodate the extra length. After last month's rundown on activities this month's effort appears to be very meagre, but I suppose that's just how the cookie crumbles.

S.W.L.'s should now be aware the Club is now awarding certificates for their group, details of this appeared in the April issue of "A.R."

Club activities for May will be commencing with a social evening at the QTH of Wally 3AHZ, to be held on Saturday, the 1st May. A Club natter night will be held on 7th May with the strong possibility of someone being dobbed to demonstrate some equipment. Our usual monthly general meeting will be held on the 21st May. Unfortunately, the April general meeting was cancelled, due to this falling on Good Friday. A second social evening will be held during the month at the QTH of Eddie 3EM on the 29th May. Our social evenings are proving very successful, plenty of ear bash time and the opportunity for XYL's to study their menfolk in action, eye-balling.

Club members are again reminded of the present effort of paper collecting. At our May meeting it is expected that there will be available a fairly large quantity of valves at give-away prices—so be in it, we want to dispose of the lot in one go. Whilst on the subject of disposals, members should be aware that if they possess gear which is desired to either sell or swop, or wish to purchase, by contacting the Club Secretary, Harold 3AFQ, these items can be listed in our monthly newsletter absolutely free of charge. 73, 3XK.

OBITUARY

NEIL TEMPLETON VK3HG

It is with deep regret that we record the passing of Neil Templeton VK3HG. First licensed in 1930, Neil's interest in Ham radio never waned and he was active on various bands until shortly before his passing. Although a keen DX-er he was frequently to be heard rag-chewing with the "locals." During the war he served with the Royal Australian Air Force and for many years had operated a base station for the bush fire net in his area.

To his sorrowing wife, son and daughter we extend our deepest sympathy.

STANLEY H. TUMBRIDGE, VK4ST

The Queensland Division of the W.I.A. sincerely regrets the passing of Stanley H. Tumbridge VK4ST on the 18th March after a brief illness.

Stan was first licensed in the early 'thirties and at Ipswich operated his station which became well known in Australia.

About this time he assisted in the forming of an Ipswich Radio Club.

For a number of years Stan also operated his station at Broadwater in the Stanthorpe District. The last 15 years or so Stan was at Woody Point.

In all areas where Stan resided he became very popular and well known, this being due to his many sterling qualities, chief among which was his being a fountain of help in many ways to those who needed assistance in any form.

To his sorrowing relatives we extend our sincere sympathy.

QUEENSLAND

NOTES FROM DIVISIONAL COUNCIL

At the monthly Council Meeting held at the Institute of Social Services, Berwick Street, Valley, on Thursday, April 1st, there was a full attendance of all newly elected Council members and the main business of the evening was to elect officers to fill the many and varied positions required to ensure smooth and efficient running of the Queensland Division of W.I.A.

Laurie VK4ZGL was elected as Chairman, and Peter VK4ZPL as Secretary. A full list of all appointments will appear in next issue of Q.T.C., the Official Bulletin of the Queensland Division.

The disposals position at the moment is very grim, and all sources of supply seem to have dried up. I do, however, hear rumours of a couple of pretty good deals that could come up shortly.

Could be quite a few new call signs in VK4 land shortly, Channel "O" seems to be making its presence felt and many six metre boys are talking of concentrating on morse.

Our Hon. Treasurer reports that there are still quite a few subscriptions outstanding, so come on fellows. How about it . . . and make at least one of our councillors happy by mailing that cheque NOW ! Thanks.

Would all readers please note call sign of your new scribe and send along any choice pieces of gossip that can be taken down, altered and used in evidence against you. 73, VK4VX.

1965 CONVENTION

Undoubtedly the highlight of Amateur Radio in Queensland is the Queensland Division of the Wireless Institute of Australia's Annual Convention held at Alexandra Headlands in April of each year, and the one held on the week-end of April 3rd-4th proved no exception.

Attendance rose to 117 this year, against 100 last year and Bob VK4ZRC is to be congratulated on the fine job he is doing each year, not so much in organising the convention, but in organising the right fellows to assist him. Hi !

Alf VK4WO, the W.I.A. Station operator, had our new Galaxy V. transmitter set up, and everyone was impressed with its appearance and operation. A Swan 400 brought along by VK4TN also aroused much interest.

Max VK4DA won the first all band scramble operating mobile with one of his famous mini-whips. Max set himself up in a good position and went to town in making contacts. Result a flat battery and Max had to toddle back two miles to HQ. Hi !

The first All-Band Scramble was won by Bob VK4ZRC. On Sunday the VHF Scramble was won by VK4ZEK (David). The C.W. contest, receiving from tapes and sending back was won by Max VK4DA. C.w. on tape by Rick VK4VR. The second all-band scramble was won by VK9ZBV/4 and VK4TN. The scramble was organised by the VHF boys to give a possible 39 contacts. Hi ! But something came unstuck.

The best home brew gear contest was won by Vince VK4VJ for a very fine version of the Delta het type front-end receiver. Brisbane trade houses donated some very handsome prizes, which were presented to winners by our Vice-President Pat VK4KB. John VK4RZ gave a very useful and informative talk on OSCAR III.

Joyce VK4JJ did a sterling job as receptionist, secretary, etc., etc., and was elected the best trained XYL of the year. Hi !

David VK4ZDF had his six meter home station set up and it really performed well.

Everyone had just one whale of a time and voted the convention a must for next year. So how about you?

Council has asked me to pass on to you Bob VK4ZRC their thanks for a good job well done.

CENTRAL QUEENSLAND BRANCH

The C.Q. Branch has an active and respectable membership. Much interest being shown in the proposed convention at Tannum Sands, via Gladstone, for the Queen's Birthday Holiday week-end in June, when the W.B. and B. Branch and the C.Q. Branch members and others hope to get together. Arrangements are in hand by the C.Q. gang for a float in the Capricorna Festival procession later in the year and for a main street window display of Amateur gear used through the years. The morse class is well under way and well attended under the care of Joe VK4CL. President Frank VK4FN active in keeping things moving. Bob VK4NG and Lance VK4ZAZ had success with OSCAR and keep 6 metres represented. Newcomer Lyle VK4ZLD also made his debut on 6 with Dick VK4ZCK and Charles VK4ZBG, our very keen secretary. Should not be long before we hear VK4SC Silas putting out a signal. Geoff VK4FK and Hal VK4DO regularly on the HF bands, the latter amongst the DX with SSB. Chilla VK4SD has a new QTH at Yeppoon and with his Swan 350 keeps the beach resort on the map. Looks like being a good year for the C.Q. chaps with interest at a good level and many trying for their ticket. Hal VK4DO.

TOWNSVILLE AND DISTRICT

Wonder if anyone else has noticed this peculiarity on 14 Mc, that when the lower end of the band is open the top end is practically dead. Have noticed this for a long period, then it reverses. Seldom do I hear now that the band is open for its entire width. Around the bewitching hour of midnight the Europeans are starting to break through and do not hold in very long at this QTH. Heard a rumour that efforts are being made to form a radio club once again. It is to be hoped that this eventuates. It is hard to believe a city of this population cannot have a club when there are many small country towns that have one where the boys can meet and swap tales of the old days when D.X. was plentiful and it was no trouble to get a W.A.C. in five or six consecutive calls. Those were the days the present newcomers hope to return. Never mind, the orbiting satellites may make tihs possible on the V.H.F.

Ted 4EJ is giving the tower a new look with a coat of paint ere he gets the Quad back up again. Charlie's 4BQ tall tower awaits the 40 metre Quad to put on top. Merv 4ZMD hopes to break the sound barrier next time he faces the barrier in the Morse Stakes. Best of luck. Basil 4ZM endeavouring to establish a VHF link with the boys in Atherton. Why not try T.V. link while about it? Nothing more has been heard about the Secondary School Radio Project. Bob 4RW is busy trying to punch holes down in the rock at the new QTH to support the tower, which already sports a new coat of paint. Ere this appears in print he hopes to have the beam working so that the boys can copy his signal with little difficulty. Never hear any word from the boys in Ingham or Innisfail. What about a line, only requires a postage stamp if not on the air. The Lower Burdekin gang seem to have gone into early hibernation now that Claud 4UX has left the district. 73, Bob VK4RW.

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SOUTH AUSTRALIA

The monthly general meeting of the VK5 Division for March was held in the clubrooms to a near capacity audience of members and visitors—Scoffers and doubters from over the border (east or west) may have the exact number present by sending a stamped and

self-addressed envelope with postal notes to the value of £3 to cover expenses, addressed to the Publicity Officer, a gentleman of the highest integrity, who will personally attend to the spending of all money received. What's that? Who is the Publicity Officer? Never you mind—don't be nosey!

Anyway, the meeting took the form of a jumble sale, and as one jumble sale is just like another jumble sale, even I, experienced padder that I am, cannot write much about such a meeting, so even though it hurts me to do so, I will dismiss the meeting with the simple statement that everybody present enjoyed themselves no end. Ye Ed. and the entire Publications Committee having now recovered from the shock, I would like to say that Ross 5KF was in the chair for the first time as the new President and conducted himself with all the aplomb of a veteran, and his handling of the meeting augurs well for the coming year.

Brian 5CA and Phil 5NN alternated as auctioneers, and both helped to keep the tempo of the night moving at a fast rate, including the shekels. The meeting closed at 10.20 p.m. officially, but unofficially was continued until the caretaker came along accompanied by his faithful Alsatian dog. Nice doggie—good doggie. See you later chaps!

That nifty toe-tapper Frank 5MZ will be flitting hither and thither about the Apple Isle (VK7 to you) early in May with a team of ballet girls, and his XYL, the XYL being mentioned only to save Frank's reputation. There is no doubt about this joker, as long as I have known him he has been bobbing up once a year in places like Ballarat, Melbourne, etc., etc., accompanied by a team of ballet girls, and now it is VK7. What has he got that I haven't? Don't answer that! Anyway, I understand all interviews with him are by appointment only. Yum-yum—and other expressions of jealousy.

Carl 5SS who is usually around whenever Frank's name is mentioned apparently did not make the ballet team (I did hear something about two left legs or something) and will try and carry on during the above-mentioned trip to VK7 by doing a spot of painting. He is on annual leave at present, and has gallons and gallons of paint at the ready, but is said to be waiting for a cool spell and when that comes will be waiting for a warm spell. This spell business will go on for a while and then the XYL will start weaving a spell of a different nature and Carl will start wielding a wicked brush—and how!

Clem 5WG is another to mix goldfish with Amateur radio and is reported to have a fine set-up in the hills. He puts a fine signal out from his QTH when he is not up on the farm at "Mount Lonesome."

Joe 5JO is in theatrical parlance "resting" at the moment of wriitng, and quite enjoying the life of leisure. I got the impression that it could go on for ever as far as he is concerned, but his XYL has other ideas and I feel that Joe's resting is about to come to an abrupt end.

Vern 5VB, otherwise known as the "Admiral," is off to Cowell for a holiday over the Easter period, and of course will be found at the QTH of his son-in-law Brian 5BI. Just imagine, whilst I am selling pies and pasties up at the Oakbank races, these two jokers will be living on a diet of fish and Amateur radio. No wonder communism has such an appeal to peasants such as myself. The scales never seem to balance!

Among the many letters received this month camplaining of the lack of judgment on the part of the Publications Committee was one from Launce 5LD, "Pop" to you, and addressing me as "My Dear Hoary Headed Old So and So." Flattery, flattery, that is all I seem to get these days, even if he did have the audacity to suggest that he never gets a mention in these notes.

March has always been a good month for me with respect to paragraphs for the magazine. So many exciting and unpredictable events usually taking place, one in particular, of course, was the fact that my Amateur licence falls due, and for many years my hazards and exploits in trying to pay the said licence were, without fail, good for at least two or three paragraphs concerning it, and with any luck possibly a couple of follow-ups. Last year all this came to an end, the P.M.G., without consulting me in any way, decided to permit me to pay my licence fee at any post office, in fact, they made it so easy that I sulked in the corner for almost three months at the loss of my easy paragraphs.

This year I perked up a little, instead of receiving the usual commonplace request for payment I received instead two accounts in the one envelope, one a duplicate to be apparently retained after payment by me.. The more I studied them, the more promising they looked, and it was with high spirits that I salied forth and lined up at the counter at the suburban post office. The female representative of the P.M.G. took the two accounts and the money, looked blankly at them, looked blankly at me, and without a word disappeared behind the Holy of Holies and went into an earnest huddle with the male representative of Paddy McGinty's Goat. Barely able to control myself with excitement at the thought of the coming encounter, and best of all, the thought of the return of all my lost paragraphs, I waited patiently for her return, determined to treat her as gently as possible, but at the same time to be as difficult as I could, in the hope that I might secure enough material for perhaps twelve monthly paragraphs. Imagine my shock and disappointment when she at last returned, handed me my duplicate receipt fully made out, practically kissed me on the forehead, and politely opened the front door and ushered me out with a beaming goodbye smile. How low can they get? How unco-operative can they be? However, don't dismay, there is a happy ending to this rather sad story. Three weeks later along came an official-looking letter, which, when opened by my trembling fingers, bluntly told me that as no records showed any payment of my Amateur licence, if they did not hear from me within one month they proposed to cancel my licence without any more ado. Well, need I say more? I nearly fell over in my haste to get to the telephone, and waving my duplicate receipt in the air as a sort of martial banner, I was transferred from department to department, finally finishing up of all places in the Radio Inspector's Department. Flushed and apparently drunk with success by this time I was quite prepared to do battle with even the Postmaster-General himself, and lost no time in telling the whole story to the gentleman who answered the telephone, only to fall flat on my fallen chest as he gently replied: "O.K. Pansy. I know you must have your paragraphs somehow or other—far be it from me to stop you, and good luck to you—see you on Single Sideband some time!!!" Then he gently but firmly hung up the receiver in my ear. Wouldn't it? How unlucky can one be? I wonder just who it could have been? Is my face red? The curtain will now be lowered on the hardy annual: "How I could not pay my Amateur licence." Diplomacy is my middle name!

Jim 5JK at the moment of writing is on annual leave and has just returned from Port Vincent after a pleasant time spent relaxing in the noonday sun. He intends to try out several gadgets in the shack for the next week or so, although he is still twitching a bit from the shock he received when his experiments on his first gadget caused his multimeter to give forth a loud and agonising boi-oi-oi-oing and the meter stick hard over! He now is a firm believer in the fundamental law that high tension is high tension, and low tension is low tension, and never the twain shall mix—on the multimeter anyway!!!

Tom 5TL, the new addition to the VK5 Council, is now the bearer of the high-sounding title, Publications Officer, and as nobody seems very happy with this title, there is a rumour that it will be changed. Anyway, the main thing is that he is on the Council and has been given a job, and if I might be permitted to speak out of my turn, I would have liked to have seen him made country members' representative because he has been a country member himself and fully realises just how such a member in the country needs representation at times in Council.

Bumped into Jack 5JS the other day and when I had picked myself up we had quite a chat on matters of Amateur radio. He tells me that he is working down Edwardstown way in a big building that is air-conditioned in the winter, so much so, that in the middle of winter they are bothered all day by repeated knockings on the front door from Polar bears who want to come inside and get cold. That's what he told me, anyway, and Jack has never been one to pull anybody's leg.

Preparing for my Easter expedition to Oakbank, I decided to give the Type 3-Mark 2 a try-out in the hills on a recent week-end. Setting up station at Longwood, in the vicinity of Mount Lofty, my first contact was with none other than Gordon 3XU and on SSB at that, may I be forgiven for so slipping down the social scale, and if ever a contact was nostalgic this one was. Gordon is an ex-VK5 of many years ago, and a one-time buddy of mine in my early days of radio, and nothing suited him better than to gallop around

the countryside, in the true Don Quixote style, looking for windmills to do battle with, being closely followed by me in awe-struck servility. We used to retire to my baronial mansion of those days each night and discuss our several lost causes, and whilst we have both matured somewhat now, we still think that "those were the days". Remember how you did battle with the P.M.G. Department over those telephone wires that crossed under your aerial? We never did find out how they always managed to be on the ground each morning, did we? Tickled pink to meet you again, Don, ahem. I mean Gordon.

Also had contact with Ray 3WO, who proudly told me that I was his first for almost twelve months. His absence from the bands had not caused his hearing to deteriorate in any way, because he discovered some hum in my signal, and when I came back on the air some hours or so after the contact, having performed some internal surgery with an axe and a crowbar, he was still sitting right on the frequency waitng to tell me that the operation was a success, and the hum had disappeared. How's that for service? Hope to meet you again sometime, Ray.

Charlie 5ON noticed by one of my spies trotting around the city streets with the speed and agility of a two-year-old, and looking the picture of perfect health. There is no doubt about these veterans, they can take it. He has been in and out of hospital over the past two or so years, more times than he cares to remember, so much so, that every time he comes within half a mile of the Blackwood Hospital they rush into the ward and prepare **a bed.**

The new VK5 President and Chairman is Ross 5KF and he has wasted no time in getting into action. In a telephone conversation with me recently he gave me all the news and details of the new Council, and the plans for the coming year, and believe it or not, he rang me, I did not have to ring him. He looks and sounds like a good bloke, although he did say, in telling me that I was again Publicity Officer, and I quote: "I don't know what that title means." When I said, trying to be humorous, "Oh, that means that I am a general nuisance," he very smartly said, "Yes, that's what I have been told." Now who has been talking? Surely not the Past President Phil 5NN, you know, the one with the iron hand in the velvet glove!

Geoff 5ZCQ besides being the Federal Councillor is now the Vice-President, and I suppose, being often referred to in the Journal as "The T.V. Type," we can expect cameras, video tapes, etc., etc., every time he stands in for Ross!

John 5JC, our genial secretary, was an absentee from the meeting, his XYL is at the moment of writing in hospital recovering from an operation, and naturally John's thoughts were far from general meetings and such. Hope all is now well, Betty.

A welcome visitor to the meeting was John 3ZCO, and judging by the number of times he marched up to the tables to collect his purchases, he must have robbed a bank on his way over. Nice to see you John, but don't take any notice of the fact that I went white when they introduced you as a VK3, it was just something that I ate for tea!

Noticed Ralph 5OL sitting up in the front rows at the meeting, and he appeared to be quite at home with the gang. Before he came to VK5 he was K6OOL, and he tells me that this call is still current but they will not let him use it—I wonder why? Anyway Ralph, make yourself at home, good to have you among us, we are quite a good bunch, even if we say so ourselves.

An old-timer in the W.I.A., Marshall Hider, was noticed sitting next to Pete 5FM and Ses 5GP at the meeting, and appeared to be enjoying himself. No doubt about this fellow, he does not look a day older than when he used to sit up at the executive table himself —and that's not a couple of years ago either.

Bruce 5MC was down from Port Pirie for the meeting and passed on 73 from Bill 6DX. Thanks Bill, good to hear from you, and I will QSP that message to Mrs. Buckerfield—I can quite understand you were upset at the news of Buck's passing. Keep up the old spirit, William.

Bruce 5MC incidentally is no longer the secretary of the Port Pirie Boys' Club, having resigned because of the uncertainty as to whether he would be staying at Port Pirie or not. He tells me that Brian 5CO is now the president, with Alan 5ZC the vice-president, and Jim 5ZMJ having assumed the reins as secretary. What has happened to the budding authoress, Bruce? Has she gone into smoke?

Les 5NJ chased me up at the meeting, and with his voice almost choked with excitement and emotion, thanked me for my efforts in putting him on to the Divisional frequency meter after two years of waiting. I thanked him for his expressions of gratitude, but explained to him that it was nothing of consequence, after all I am known in some circles as "Get things done quickly Parsons." As a matter of fact I have a member waiting for the RF oscillator, and he is in his fourth year of waiting. He mutters and splutters a bit whenever he bumps into me, but after all, we must not travel too fast. Ho-hum, what it is to be efficient!

I am still trying to find out just how the photo of me on the front page was spirited across the border, and who was the mastermind who planned it all. The photo was an old one; almost 10 years old, and to my knowledge never left the house, where it is at present sitting on top of a china cabinet in the sitting room. The field has narrowed down to Pincott 3AFJ, or my XYL. Time will tell.

Incidentally, several S.W.L.'s have written to me pointing out that in the photo I am reading a S.W.L. magazine, and where could the magazine be bought these days? Sorry chaps, I can't help you, it was just a magazine I idly picked up at the Council meeting held at Gordon's place 5XU and as that was 10 years ago—your guess is as good as mine.

Noticed Comps 5EF at the meeting with a look on his face like the cat who ate the canary. It had me worried all night. The answer is now common property of course. He will write the notes for the magazine during my coming vacation, and of course you all realise just what that means—you will be fed a diet of SSB, and then some SSB, and then for luck, some more SSB. You all have my entire sympathy. However, should he by some remote possibility deign to mention my name, and I strongly doubt it, just treat it with ignor, remember, that now he is retired and living the life of luxury on his estates at Gawler, he is completely out of touch with Amateur radio in VK5 and thus will have to descend to insults and libel to fill the column. It goes without saying that he will be aided and abetted by Ye Ed., and the Magazine Committee, so take out 150 per cent. of what he says, and then forget the rest. Remember, my modesty, my purity of thought, and last but by no means least, my lily-white innocent nature will surely triumph in the end. Which end? Don't be coarse!

73 de 5PS—PanSy (H.A.) to you.

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TASMANIA

One of our best ever dinners followed the Annual General Meeting held in Hobart on March 27th last. About 45 members attended the meeting where your Council for the year was elected and other official positions filled.

Quite a few members came from the North and North-western Zones, including 7OK, 7ZLP, 7ZAY, 7ZAA, 75F, 7ZBE, 7CH, 7ZAH, 7XL (apologies to any left out), many of whom brought XYL's to the dinner, where about 60 were seated to a most enjoyable three-course meal. Our guests were Mr. and Mrs. Munro and Mr. and Mrs. Melling, of the Radio Branch of the department. Mr. Munro in his address mentioned the growing shortage of C.w. operators and suggested that limited licence holders should not be content to rest with that licence but should persevere and get that elusive C.w. and gain a full ticket.

Your VK7 Council for the year consists of Tom 7AL, Tiny 7JD, Ian 7ZZ, Terry 7CT, Charlie 7K5, Ted 7EB and Geoff 7ZAS. Might I take this opportunity to thank all voters for their show of confidence in the previous Council by electing them all for a further 12 months. That does not mean we would not like to see a few more members nominate next year, and a few more members helping out with those extra little jobs that have to be done to keep things running smoothly. Just think for a moment, if for some reason or other, most of your Council failed to turn up at a meeting one night. What would you do to help out?

Now that our I.T.V. commitments have been met, Council reckons it is high time we got going again on our clubroom fund, with a few social evenings, outings, raffles, etc. So give any functions your full support, make up a party and bring your friends with you.

Last month I mentioned that we were losing Bill 7YY to VK4, however, he has been given a month's reprieve, as he pulled a cartilage in his knee, and has been hospitalised for repair. However, at time of writing I am pleased to report he is home again. Let's hope you have no more trouble from that source, Bill!

Another new call heard in the south is Mike 7ZMK, who lives in Hobart, been heard with a F.B. sig. by most of the locals on 2, haven't hard you on 432 megs. yet Mike, but no doubt we'll have a QSO when you get organised properly on that band.

Ken 7LL is keenly interested in Amateur T.V. and would be pleased to hear from any other local boys with similar interest, as he is anxious to get things going. Understand he has quite an amount of bits collected, only got to get them in the right order and we will have another channel to watch—no commercials either. What about putting a medical series on, Ken? A suitable title would not be hard to find. How would "Doc's Diagnosis" or "Medico Melville" go? Or you might try "Kuttin' with Ken" or "Kelly's Komplaints."

Our thanks to Bill VK3ABP, who has provided nightly info. on OSCAR III. This has been very much appreciated in VK7, Bill. Understand VK3ATN was heard in Hobart via the satellite, although no 2-way contact was made. Several locals have heard OSCAR, 7ZAO, 7ZAI, 7ZJG, 7LL, 7ZZ to name some. Cannot speak for the North and N.W. Zones, although 7PF and 7LZ I believe did work via the little fellow.

Lee 7KC now has his SSB transceiver working satisfactorily, and installed in his vehicle, and Ted 7EJ has his rig going also, although not on all bands as yet. Incidentally, Ted will have been to VK3 and back by the time you read this. Another member who certainly does his bit; hasn't spent Easter with his family for some years now. As your VK7 Federal Councillor he will be attending the Federal Convention in Melbourne this year.

Snowy 7CH has been Mobile Marine lately, says there's some good DX on 7 megs. when you get away from the man-made QRM found inshore.

Now I must have my usual grumble. I maintain, and always will, that a contest does not finish till you have put your log in the post, and posting your log is just as important, if not more so, than working a swag of stations. What I'm leading up to is this: Our recently held Athol Johnson Memorial Contest saw about 20 stations participating, yet as log checker, with logs to be in my possession by 31st March, I have 3 logs (and one of those is mine). One chap is still carrying his in his pocket. Makes my job easy, only three to check but it means there are only 1st, 2nd and 3rd to be declared. If you went to the Melbourne Cup or any other race for that matter, and 20 horses started, and 17 of them pulled up short of the post, you would reckon it was a pretty poor show. Well, that's the way I feel as I write this, and it doesn't only apply to this contest, so think it over. If you don't like writing your log out again for posting, then buy or borrow a bit of carbon paper. Now after that let me congratulate on behalf of all, Reg 7RL on a very fine effort in winning this year's A. J. Memorial Trophy with a score of 5,070 points. Reg made it 5,027 but he took part miles instead of the next nearest mile in his calculations. Yours truly 7ZAS runs second with 4,851 points, whilst in 3rd place comes Wolf 7ZAG with 124 points.

Enough for this month or we will have to have another page. 73, Geoff 7ZAS.

NORTH ZONE

March brought with it (as usual) the Annual General Meeting to the zone. A new band of officers was elected and they are: President, Bevan 7ZBW; Vice-President and Treasurer, Peter 7PF; Secretary and zone correspondent, Leigh 7ZLP; and QSL Manager, Col 7LZ.

Notable by his absence from any of these positions is Den 7DK. For the past three years Den has been President, and I would like to thank him on behalf of the zone for all the work he did so ably and willingly over this period.

While on the subject of Annual General Meetings the Divisional Meeting and Dinner was held in Hobart recently. Although only four members of this zone attended we all enjoyed ourselves thoroughly. Congratulations and thanks to those responsible for this most successful function.

While in Hobart I had my notebook and spy camera at the ready at all times, as usual. Seems there was a painting spree on that week-end and one member even brought some visible signs to the meeting just to prove it.

Only other unusual thing I noticed was that our devoted broadcast officer did not sound his usual cheery self the next morning. Of course, this had nothing to do with the night before, did it, Ted?

However, returning to the north, very little social activity has been noted lately. The zone now has a T.V. star in its midst, who, for various reasons wishes to remain anonymous, but I hope everyone watches him regularly, and sees the Institute badge displayed on his lapel. What better publicity could be asked for?

Norm 7ZRG has taken the plunge lately, and at the time of writing is still on his honeymoon. Best of luck and future happiness to you and your XYL, Norm.

Congratulations to Peter Dowde, who passed the ticket at the last exam. Hope to hear a signal from you soon.

OSCAR III brought considerable 2mx activity to the north with very pleasing results. Three contacts were made via Oscar by two zone members, Den 7DK and Col 7LZ (and there are tapes to prove it!). A good job well done by both these C.w. operators. Incidentally I think these were the only three Australian contacts via Oscar. Have I any takers on this point?

Another item of V.H.F. interest is that some weeks ago Col 7LZ worked 3AEE on 432 Mc. for 50 minutes with signals never falling below S7. Quite an achievement for this band.

While on the subject of our T.V. star I should have mentioned that we also have a star of the stage. It's that man in the tartan shirt, Greg 7ZGP, who was thrilling the audience of a recent local production of a Scottish musical with some really swinging laments and reels. Sounds as if some bagpipe noises have crept into his modulator of late, too.

Activity on the H.F. bands has been on the increase lately. Still the only starter of 20 is Den 7DK, who also occasionally pops up on the other bands with his "duck talk."

Constant 80 mx activity has been supplied by Harry 7BR, who does not come on, apparently, until fairly late in the evening. I know he's only doing this to avoid my snooping, but one of these days I'll catch up with him.

I was very pleased to hear the news of another northerner on 80, Ted 7BB, operating from Poatina. Ted is only on during the week, so keep a look-out for him and give him a shout.

To complete this round of happenings on the D.C. bands, Len 7BQ now has his new H.F. transmitter going and is getting good reports with it.

Now before I close a word of warning to the Southerners. I will be moving south for several days in the middle of May on an espionage trip and will be accompanied by one of my agents, that aforementioned character in the tartan shirt. You won't be able to complain, you've had fair warning. 73, 7ZLP.

NORTH-WEST ZONE

Once again there was a good turn-up for our monthly meeting at Ulverstone. Doug VK7AB, who is on holidays and now resident at Oatlands, was welcomed to the meeting by our President, Syd VK7SF. Doug. now has his S.S.B. rig working and we should soon hear more of him on the bands.

The main topic of interest was the W.I.C.E.N. project and our secretary, George 7XL, now has a complete list of all mobile and fixed stations which could be used in an emergency. When the taxi-phones are available there will be much more activity on the V.H.F. bands.

After the meeting Winston 7ZWN showed us how to get free electricity. "Look dad, no wires." Surprising just how much R.F. is put out by a mobile station.

Wonder what happened to the results of last year's "R.D." Contest?

The Annual Meeting and Dinner held at Hobart was voted a great success by members who attended from this zone and a good time was had by all. Remember chaps, subs. and zone fees are now due. Have you paid yours yet?

Not much activity to report this month, so will see you on the bands. 73, VK7KH.

HAMADS

Minimum 5/-, for thirty words. Extra words, 2d. each.

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A.W.A. Carphone Senior, converted 146 Mc. F.M., 20w. input, £15. 12v. power supply for above, £5. 6 mx Mobile Transceiver, converted Pye; receiver tuneable 52-53.5, at best 1uV., Tx 4w.; 12v. power supply and mike, completely overhauled and resprayed with mounts, £16. S.s.b. Transceiver, 3 band, xtal filter, 6CD6 p.a. in-built speaker and mike, complete with power supply, commercial appearance, 19 valves, £100. 12v. transistor power supply, suit above, £40. 40 mx xtal locked Converter, new, £5. Heathkit sweep/marker Generator, hardly used, £20. Mobile Transmitter (or home), Geloso to 6DQ6 p.a. 80 through 10, 30 to 60 watts, includes separate 2 mx transmitter QQE03/12 p.a., common modulator QQE03/12 switched between transmitters, a.m.-c.w.-m.c.w. all bands, 12v. transistor power supply and mike, fully metered and p.t.t., case size 15 x 6 x 7, good appearance, £50. 40 mx "Master Mobile" whip with extra 20 mx loading coil, £5. ASB8 Receiver, converted 432 Mc., £6. Genemotor 12v. in 365v./275mA. out, £2/10/0. VK2ASZ, Lot 27, Rusden Rd., Blaxland, N.S.W.

FOR SALE: Bendix Freq. Meter, 221m., cal. book, spare valves and crystal, vol. reg. power supply, new condition, £40. 128 Transceiever, mike, phones, spare valves, 1200 Kc. i.f. crystal, clean cond., £12/10/0. R. Campbell, 6 Watson St., Sorrento, Vic.

FOR SALE: Communication Receiver Lafayette HE8O, 14 tubes, receives a.m., f.m., s.s.b., c.w. and all Ham bands, including 6 metres. Brand new and unpacked, complete with speaker and transformer, £98. Phone: 44-3181 (Sydney).

FOR SALE: G2DAF Com. Rx, prof. built, brand new parts including coils from Electoniques (U.K.), also commercial xtals, etched front panel, 160-10 mx u./l. sidebands, a.m./c.w./s.s.b., motor tuning, aerial attenuator, xtal calib., n./lim., etc., complete with handbook. Cost £180. Would consider part exchange Mosley TA33 beam or Galaxy V.F.O. Offers and particulars, D. M. Slowan, Spreyton, Tas. (VK7MS) 72117 (phone).

FOR SALE: National NC-300 Receiver, in excellent condition, £150; Murphy B40 Receiver, £40; AT14A Transmitter, £65; 150w. r.f. deck with geloso v.f.o., £25. VK3WK, W. Bell, Wangoom, Vic.

FOR SALE: Three element rotary Beam; 35 ft. steel Windmill Tower (standing); Prop Pitch Motor, £30 the lot. Buyer to remove from 29 Clyde St., Oakleigh. Also AR7 Receiver, very good condition, bandspread, 20 mx, £25. Gear, Ex-late VK3SB. Cheap for quick sale. For inspection write or phone VK3HJ, V. H. George, 34 Inga Parade, Mt. Martha, Vic. (Phone Mt. Martha 4-1487.)

POWER TRANSFORMER: Prim. 210-230-250v., sec. 1160v., c.t., 0.83 k.v.a., £15. Dynamotor, 6 or 12 v. to 500v., 160/ma, £5. VK3ZKG.

SELL: R.C. Bridge (R. & H., Sept., '63), £9. Audio Oscillator, 25 cycles to 30 k.c., £10. Valve Tester (all tubes), £10. Oscilloscopes, 2", £15; 3", £25. All in first class order. Wanted: Out of order Communications Receivers, AR7 coil boxes (any condition), Tape Recorder, 35 mm. Reflex Camera. Willing to exchange on above gear. Cash adjustment either way. H. Roach (SWL 3163), 28 Foster Avenue, Glenhuntly, Vic.

TWO Meter Gear—Tx and power supply with QQE04/20 final, AB1 mod., spare QQE04/20. Converter with 4 tubes out at 4 Mc. Other Gear—two power supplies, one with tapped h.t. to 1,000 volts and separate 400 volt on same chassis, other 550 volts and 400 volts on same chassis, P.M.G. type 5½-foot rack. Apply A. W. Chandler, 1536 High St., Glen Iris. Phone 50-2556 (Vic.).

WANTED: Commercial Trap Antenna, JA33 Tribander or similar. Price and particulars to VK4UW, Bartlett, 16 Trent Street, Mt. Gravatt, Brisbane, Qld.

WANTED: Gill Cowl Motor or other Beam Rotating Device. H. Webber, VK3PW, 3 Khartoum St., Caulfield, S.E.7, Vic. (Phone 50-6023.)

WANTED: Manuals or circuits for A.W.A. No. 19 Mk. II Transceiver and Marconi 1155A Receiver. D. R. DeCean, WIA-L5049, 10 Lascelles Ave., Brighton, South Australia. (Phone 96-7098.)

WANTED: 4X150 or 4X250B Tubes, with or without sockets. Reasonable price paid. Contact VK2ATO, 33 Collingwood St., Drummoyne, Sydney. (Tel. WA1875.)

WARBURTON FRANKI

● TRANSCEIVERS

TOKAI MODEL TC-911

- Nine transistors, with crystal control circuit.
- Compact and light weight.
- One-hand operation.
- Separate built-in speaker and microphone for telephone-like operation.
- Economical—uses seven pen light batteries (supplied).
- 5 ft. telescopic whip antenna.
- Earpiece and carrying case also supplied.

Frequency—27.24 Mc. (11 metres).
Output—130 mW. (non-distorted).
Size—7" x 3" x 2".
Weight—1¼ lbs.

£33/15/-

Plus S.T. 12½%. Set of two.

● GELOSO COIL KITS

MODEL 2676

Five Bands—Covers from 520 Kc. to 18.5 Mc. You get—

- Completely wired coil bracket with switch.
- Pair of 455 Kc. iron-cored i.f. transformers.
- Two-gang Tuning Condenser with built-in trimmers.
- Complete Dial Assembly including calibrated glass 3⅞" x 4⅜".

117/-

Plus S.T. 25%. Pack and Post 2/-.

● TRANSFORMER RECTIFIER SETS

A. & R. Transformer and Matching Contact Cooled Rectifier. **Output**: 250v. d.c. at 60 mA. Much cheaper than ordinary transformers using valve rectifiers, or silicon diodes. Suitable for instruments, radios, amplifiers, etc.

36/- set

Plus S.T. 12½%

ALSO

Low Voltage Sets—Transformer and Rectifier to give output of 12-15 volts at 2 amps. Suitable for model trains, transistor radio power supplies, etc.

41/- set

Plus S.T. 12½%.

● RECORD PLAYERS

Imported three-speed.
Amplified models. Good output and excellent tone.
Wooden, plastic cloth covered cabinets.

£9/15/-

Plus S.T. 25%, plus Pack and Post.

PROTECT YOUR PREMISES WITH THE

● SCOTT ELECTRONIC EYE

- A.C. Mains operated.
- Kit consists of light source and eye unit.
- Complete with power supply, amplifier, buzzer, hardware and connecting wires.

Use across doorways or other openings up to 25 ft. wide.

£16/13/4

Plus S.T. 12½% plus postage for weight of 4 lbs.

Extra—Extra—SPECIAL BARGAIN

WHILE THEY LAST!

NEW SPACE AGE POWER COMPACTNESS

MITYAMP

- Powerful 2-watt Transistor Audio Amplifier **Module.**
- Completely encapsulated in epoxy resin.
- Cannot be affected by high humidity or salt.
- Will function submerged in water.

Size: 2" x 3½" x ⅞" thick.
Weight: 6 ozs.
Frequency Response: 20 cycles to 15 Kc. +2 db. at 1 watt level.
Input Voltage required to drive full power: 0.5v.
Input Impedance: 45 ohms to 50K ohms.
Output Impedance: 3.2 ohms to 45 ohms.
Power Requirements: 6 to 12 volts at 300 to 700 mA., according to speaker voice coil impedance.

Complete instruction leaflet supplied showing how to make Intercoms., Signal Tracer, P.A. Systems and Record Players.

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Plus S.T. 12½%, plus Pack & Post 2/-.

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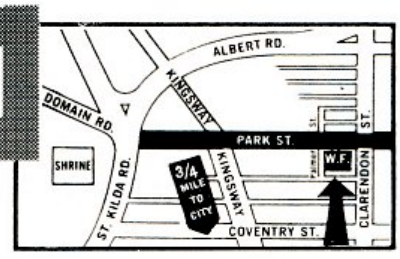

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